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BIOMEDICAL AND BEHAVIORAL SCIENCES

No. 55

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BIOMEDICAL
Aerospace Medicine

USSR

SIDEL'NIKOV, I.

I WANT TO FLY

Moscow AVIATSIYA I KOSMONAVTIKA (Aviation and Space Science-Astronautics) in
Russian No 6, Jun 76 pp 28-29

[Abstract] This is an "answer to the readers' questions" column explaining the requirements for admission to air force schools. Due to stringent requirements placed on future pilots by fast flying airplanes, the candidates are screened in a very thorough manner not only with regard to their physical health, but also to their emotional stability and reaction to stimuli. There are several levels of medical flying commissions, consisting of therapists, surgeons, neuropathologists, otolaryngologists and ophthalmologists who screen the candidates in their respective fields of expertise. Basically, all young men are eligible for such schools, provided they are healthy, they are intellectually highly developed, have good physical preparation and a clear desire to fly. No references, figures or tables.

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USSR

RUDNYY, N. and PESTOV, I.

ERGONOMICS AND SPACE MEDICINE

Moscow AVIATSIYA I KOSMONAVTIKA (Aviation and Space Science-Astronautics) in
Russian No 7, Jul 76 pp 34-35

[Abstract] One of the tasks of space medicine is making it possible for manned space flights to be effective and safe. This led to development of a new science--ergonomics, which is devoted to the study of optimization of the relationship of man to living space and technological systems in the process of routine activities. Many complex tasks had to be solved having a direct bearing on the success of the mission, on safety of the astronauts. Improvements in the system "human-machine-medium" depends on the optimization of many factors characterizing the system. A series of such factors is analyzed from the medical point of view. The conclusion is reached that consideration of medical requirements in constructing and equipping manned space ships coupled with a rational professional activity of the crew improves the ergonomic characteristics of space systems, improving the effectiveness and safety of manned flights. No references, tables or figures.

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USSR

APENCHENKO, YU., PRAVDA Special Correspondent

PHYSICIANS AND SPACE: REPORT FROM THE FLIGHT CONTROL CENTER

Moscow PRAVDA in Russian 4 Aug 76 p 6

[Translation] In its many long years of encounter with weightlessness, space medicine has overcome several serious obstacles. Even the prologue to the struggle was unusual. The question as to whether people could endure rather prolonged flights in near Earth orbit without damage to their health had to be answered prior to the beginning of the experiment. The problem of adaptation then arose. It turned out that one does not immediately become accustomed to "weight loss." As the duration of flights increased it became clear that the return to the Earth's shores from the ocean of weightlessness was not at all harmless and required preparation.

Although the acuteness of the problem has diminished with time one can find no basis for the claim that all the difficulties are over. Observing and protecting the health of cosmonauts, specialists are increasingly taking advantage of the possibility of increasing the information on the human organism in general and giving new interpretations to well studied phenomena.

"Space medicine is a young field, during its growth it constantly turned to developed, traditional areas of knowledge and borrowed the experiences of physiology, hygiene, aviation medicine, and psychology. The time has come to return the debt." This is the way I. D. Pestov, doctor of medical sciences, evaluates
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APENCHENKO, YU., PRAVDA 4 Aug 76 p 6

the situation.

Physiologists have studied blood circulation for centuries. Weightlessness changes the approach to the problem. Blood also "loses weight" and begins to circulate differently than on Earth. How is it different? It has been noted, for example, that the legs of cosmonauts lose volume during flight. The blood rises to the head. What happens to the excess fluid? One of the answers is that the excess is discarded and lost and the organism relieves itself of the unnecessary load. However, this is not an endless process, there is a limit to possible losses. We again turn to the question as to where the blood disappears, and how is the blood redistributed.

"This is a very important problem." So states V. A. Degtyarev, candidate of medical sciences. "Presumably, the blood goes to the lungs, later to the liver, and gastrointestinal tract. This is assumed inasmuch as the organism is capable of unexpectedly demonstrating hidden potentials. For example, during prolonged space flight the veins become reservoirs for blood which has risen to the head.

All this might appear to be excessively specialized material suitable only for scientific dissertations. However, in the final account, it involves the possibility of people adapting to unusual situations and our bodily reserves of strength and flexibility. Prolonged bed rest serves as a partial approximation to weightlessness on Earth. The thread of the comparison rises, to orbit. This

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APENCHENKO, YU., PRAVDA 4 Aug 76 p 6

is understandable. Weightlessness was first "worked up" on terrestrial models. Now it is showing how to deal with the consequences of enforced inactivity on Earth. A training device, similar to the space "running track," is being tested at the clinics of the Central Institute of Traumatology and Orthopedics. One can "run" on it without rising from the bed. The Institute of Surgery imeni Vishnevskiy is testing a device which will assist in returning stability to a person's upright position. This is how the post-flight protective suit for cosmonauts is beginning everyday service.

However, isolated individual examples only explain the main points of the issue. The problem of hypodynamia is quite extensive. A low level of physical activity has become the unacceptably high price of technical progress, freeing millions of people from physical work and finally even from the necessity of walking very much. Space medicine, searching for methods of dealing with weightlessness, has studied in detail the behavior of the organism when deprived of natural loads and weight, and is capable of giving well based recommendations for the prevention and treatment of low levels of activity.

The most interesting and fascinating experiments are frequently disguised by the short and dull title of the experiment. Take the study of breathing, for example. What is there to study, inhale--exhale? However, a doctor "looks over" dozens of precise readings. Pulmonary ventilation (how much air passes

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APENCHENKO, YU., PRAVDA 4 Aug 76 p 6

through the lungs per minute) characterizes the body level of energy consumption. The vital capacity of the lungs (the quantity of air which an individual can inhale) indicates their functional reserves. It is important here to recall that during weightlessness the lungs can be potential blood storehouses. The speed of inhalation and exhalation is linked to the cardiovascular system, the muscles, and other parts of the body.

It is not the volume of information that is most surprising, but its multifaceted nature. It is surprising that the object of research, the cosmonaut, is orbiting at tremendous speed around the Earth. The equipment of the orbital station working for medicine is the fruit of the most modern engineering. From the very first steps of their science, space doctors have been working hand in hand with designers, physicists, and specialists in electronics and communications. The remote observation of the patient and the exclusive orientation towards indirect methods of research which do not damage the organism are the contribution to the ancient science of healing which has been made from orbit.

For a long time cardiologists of various nations have dreamed of the possibility of rapid long distance transmission of information on the state of the patient. This dream is not only realizable, but has been put into practice. For example, cosmonauts' electrocardiograms are regularly transmitted to Earth. They were transmitted when "Salyut-5" was over the Atlantic. The signals from the orbital station were received by the scientific ship, the Kosmonavt Yuriy

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APENCHENKO, YU., PRAVDA 4 Aug 76 p 6

Gagarin, retransmitted through the "Molniya" communications satellite and received in the Crimea, at the Flight Control Center. They are high quality, 12 lead electrocardiograms.

What did they show?

Everything is normal. Volynov and Zholobov are feeling well.

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USSR

ZHELEZNOV, N., TASS Special Correspondent

COSMIC MEDICINE COMES DOWN TO EARTH

Baku VYSHKA in Russian 5 Aug 76 p 4

[Translation] "Are the medical personnel with us today?"

"They have again given you, 'Baykaly,' an excellent mark. The MI-1 experiment was successful. Tomorrow the program calls for MI-6." We almost daily hear such dialogue between Earth and the crew of the "Salyut-5" orbital station. Of all the scientific "shops" on the station the medical laboratory has the greatest load of diverse experiments. The cosmonauts, in spite of the heavy schedule of other scientific research, eagerly respond to the requests of the doctors, who, in addition to daily observation of the cosmonauts' health are carrying out a complex of thorough medical research projects. The flights of the crews on the "Salyut" and "Skylab" orbital stations have already proven the possibility of prolonged human space flight. What then explains doctors' ceaseless questions about weightlessness and behavior of the human body in space. The reason is that from flight to flight the methodology which scientists use to solve the problems of "humans and space" is becoming more thorough and precise.

I. D. Pestov, doctor of medical sciences, answers these questions. Today, he states, it is somewhat strange to recall that we faced such questions before

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ZHELEZNOV, N., VYSHKA 5 Aug 76 p 4

we could solve the problems of the first manned flight. Can people breathe in weightlessness? Are they capable of digesting food? Is it possible in principle to change the mechanisms of the cardiovascular system outside of the Earth's gravitation. Beginning with the flight of German Titov, completed on 7 August 1961, it became clear to us that weightlessness was by no means a harmless factor to humans. We then learned about the objective sensations of people encountering weightlessness and began to make a detailed study of the reasons for such disturbances as motion sickness and dizziness. We now have a detailed acquaintance with occurrences in the human body under such unusual conditions. We have begun to train people for active adaptation to the cosmos. We know how to ease the period during which cosmonauts meet this "enemy number one" and how to prepare the body for a safe "encounter with the Earth."

However, we still face many problems. The main one is still the detailed study of the consequences of prolonged flight on the human body. We are now studying this problem in the course of experiments which are being conducted by Boris Volynov and Vitaliy Zholobov on the "Salyut-5" station. "Levkoy," "Omega," "Pal'ma," are only some of the experiments in which cosmonauts are

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ZHELEZNOV, N., VYSHKA 5 Aug 76 p 4

helping us study the most precise functions of the body under the conditions of weightlessness. Their complexity is shown just by the fact that we are using 14 parameters to study such a simple vital function as breathing. Experiment MI-6 is another innovation in our medical laboratory. We are studying the mechanism of blood circulation between the head and the liver. According to preliminary data, the liver, under weightless conditions, carries out a unique additional role as a "blood bank." In principle this could lead to certain congestion phenomena in the internal organs.

While one now talks of the main tasks of research in manned flights, medical monitoring itself accounts for no more than 10 percent of all the medical information received from orbit. Our main task is the creation of a solid scientific base for medical support for future manned flights.

Today, 15 years after medical personnel made the decision on the first human flight into space, space medicine has already paid many of its "debts" to terrestrial medicine, said I. D. Pestov.

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ZHELEZNOV, N., VYSHKA 5 Aug 76 p 4

In solving the special problems of the bodily functioning under the conditions of weightlessness, space medicine has made a decisive contribution to hypodynamia, a major clinical problem. Doctors encounter it on Earth quite frequently, in particular during the treatment of trauma and cardiovascular diseases. Hypodynamia is characteristic of the state of the cosmonaut working under weightless conditions. However, on Earth this phenomenon is linked to the consequences of restricted physical activity and now extends far beyond the horizons of treatment institutions. The process of urbanization, increased comforts in life, and improvements in the methods of transportation have inevitably had an effect on the organism and on human health. It has already been shown, for example, that the condition of a person undergoing a two month bed rest is roughly comparable to the condition of a cosmonaut returning from a space flight. Recall, however, that because of a complex of preventive measures Klimuk and Sovast'yanov were able to walk on their own immediately after their return from a 63 day flight. A person who has spent a long period of bed rest must practically relearn how to walk. This is, however, no longer quite the case. Using as a model the training devices which are on board

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ZHELEZNOV, N., VYSHKA 5 Aug 76 p 4

orbital stations to help people "remember the Earth," equipment has been developed which will help carry out a course of preventive measures against hypodynamia for patients at the Central Institute of Traumatology and Orthopedics. Devices similar to the physical trainers for cosmonauts have been installed on the hospital beds of this institute. A person, who because of injury must remain in bed thus has a possibility of, so to speak, taking walks twice daily. The first results of research at these hospitals with "active bed rest" conditions indicated that the space methods have passed their exam on Earth. In this sense it would be no exaggeration to acknowledge the special services of space medicine in the solution of an old problem to doctors, how to "come out of an infarction," actively or passively? Today the majority of the world's hospitals are practicing the method of reduced bed rest for patients recovering from myocardial infarctions, based on the experience of the study of human hypodynamia in space flight. Another concept of space medicine has returned to earth and is being successfully put into practice at the Institute of Surgery imeni A. V. Vishnevskiy. Here patients, who, as the result of prolonged bed rest, have lost the ability to stand, recover it quite quickly with the help of equipment similar to the vacuum equipment in the arsenal of the cosmonauts' medical laboratory.

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ZHELEZNOV, N., VYSHKA 5 Aug 76 p 4

However, space medicine has not only applied its unique equipment to terrestrial clinics, but also its original research methods. The requirements of space science has stimulated, for example, widespread introduction into clinical practice of such methods as the ultrasound location of the heart, rheographic research (studying the electrical resistance of the organism's living tissues). Even the system for transmitting medical information from space to Earth is a model for methods of automatic collection of medical data and its long distance transmission to leading diagnostic centers in the nation which are now being developed in the nation's hospitals. In this sense it is symbolic that the "Molniya-1" a long range space communications satellite has been used in the long distance transmission of medical data.

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USSR

KONOVALOV, B.

COSMONAUTICS IN THE SERVICE OF EARTH MEDICINE

Moscow IZVESTIYA in Russian 3 Aug 76 p 5

[Text] Cosmonauts are ordinary people working in unusual conditions. Of course, they are specially selected and trained for a long time for this work. However, when they rise into space, we especially understand how strong is the thread which connects them to Earth. If there are a few seconds free during communications sessions they are invariably interested in what is new at the Olympics, here at the Flight Control Center, and in the home base Star city. When, on Sunday, the Flight Control Center arranged a pleasant surprise for Vitaliy Zholobov, a conversation with his daughter, who was vacationing in the Crimea at a pioneer camp, everybody saw the joy that lit up his smiling face.

Their encounter with weightlessness has already stretched out for more than three weeks. Starting at the cosmodrome, the cosmonauts began to prepare for their encounter with this world without gravity. Prior to the flight they slept without pillows, on beds inclined so that the blood would flow into the head. In space people are deprived of the effects of the force of gravity, to which they have become accustomed since the womb. Blood, which here on Earth

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KONOVALOV, B., IZVESTIYA 3 Aug 76 p 5

accumulates in the lower half of the body flows to the upper half in space. Cosmonauts note that during this condition they feel as if they were hanging head down from a horizontal bar. This unpleasant feeling is one of the manifestations of the rearrangement or adaptation of the human organism to the condition of weightlessness. For Volynov and Zholobov this period lasted about four or five days. Now they feel well.

To space medicine, the study of the behavior of two additional people during extended flight primarily means the accumulation of statistical material for further analysis, and the development of methods for dealing with the unpleasant consequences of weightlessness. This is preparation for the future inhabitation of space. Just what can this research contribute to medicine on Earth?

The study of cosmonauts' health is, it turns out, useful to our health service. From the physicians' point of view, the best model on Earth for space flight is bed rest, which is frequently prescribed to us by our doctors. During this the force of gravity does not act vertically, but horizontally (the load is partially reduced) and the person is relatively motionless; movement, as in space, is restricted. When absolutely healthy people undergo "bed rest" simulating prolonged weightlessness it has been shown that there are changes in the organism: the density of bone tissue is reduced (calcium is removed) the

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KONOVALOV, B., IZVESTIYA 3 Aug 76 p 5

muscles atrophy, the nature of metabolism changes, protein synthesis is reduced and there are even changes in the higher nervous system. Disturbances in the body are the cause these phenomena viewed as a whole. Space medicine is carrying out this research not only to determine the effects, but to prevent them. The methods which have been developed are useful to medicine on Earth. Igor' Dmitriyevich Pestov, doctor of medical sciences, explained to us that the so-called post-flight prevention suits which cosmonauts wear under their space suits prior to landing have been tested at the Institute of Surgery imeni Vishnevskiy. These suits create excess pressure in the lower half of the body. When the cosmonaut lands on the Earth after experiencing weightlessness, the blood rushes downward and its sharp flow from the head can cause fainting and dizziness. The suit can successfully prevent dizziness, not only for cosmonauts but also for patients with back injuries who have begun to walk after long periods in bed.

The well known multipurpose physical trainer which cosmonauts use in special suits attached by elastic straps to the "floor," to do exercises, walk and run, are also useful to medicine on Earth. At the Central Institute of Traumatology and Orthopedics, patients who have had operations on the spine walk on a roller

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with a vertically arranged walking track, they make contact with it and walk on it while lying in bed. The process of recovery is much faster than usual. The Earth is constantly following conditions of its envoys to space with the help of data transmitters and telemetric systems. In addition, specially developed compact equipment permits the "Earth bound consultants" to periodically make detailed surveys of the state of the cosmonauts' bodies. These methods of remote monitoring are not only suitable to clinical methods but also to sports. Many athletes, including Olympic participants, whom Volynov and Zholobov congratulated for their brilliant victories at Montreal, use, during their training, equipment developed for cosmonauts.

There are very many such examples of the help that space medicine, which grew up on Earth, is now generously giving to repay its "debts."

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GOLOVANOV, YA., KOMSOMOL'SKAYA PRAVDA Special Correspondent [Interview with Head of the Group of Medical Monitoring and Medical Biological Research, Flight Control Center (Not named)]

THE WORLD OF WEIGHTLESSNESS

Moscow KOMSOMOL'SKAYA PRAVDA in Russian 13 Jul 76 p 4

[Text] [Question] Among the scientific experiments which are conducted on board the "Salyut-5," medical research is interested in everything, since medicine is always interested in everything. However, before you discuss this how would you formulate the main task of "space doctors?"

[Answer] I would say: we should protect the health of cosmonauts and ensure the implementation of the intended flight program. We thus support the vitality and future of piloted flights.

[Question] I know that many of our readers have a somewhat simplified impression of the medical training of the crew: their health is examined, they are spun on a centrifuge, and they are ready. There is, however, if one could put it this way, an ideology of such training. Cosmic medicine, as any other science, is based on a definite philosophical foundation...

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GOLOVANOV, YA., KOMSOMOL'SKAYA PRAVDA 13 Jul 76 p 4

[Answer] Without a doubt, Piloted flight into space requires training, equipment, and people. Scientists, engineers, and designers are already well aware of the conditions in which space structures, equipment, and instruments will operate. Many of these conditions, for example, temperature, or the level of radiation, can be recreated on Earth and thorough tests made. Those which are difficult to simulate, for example, weightlessness, can be conceived. No one will build an instrument with a pendulum mechanism for space since a pendulum will not function in weightlessness. Thus, the preparation of equipment for space above all involves the calculation of the specific environmental conditions in which it will operate. However, a person cannot be created from environmental calculations. He is the same as when he was born, his mother not suspecting that he would work in outer space. Nevertheless, doctors should give specific guarantees of the reliability of crew operations and establish the basis for their functioning in space.

[Question] From your words one can draw the conclusion that space medicine should widely use statistical methods...

[Answer] The further we go into space the more they should be used. The main source of information for us is the flight itself. When there were only a few cosmonauts we experienced a definite information hunger. Today, when there are dozens, and when 13 of our cosmonauts have been into space more than once, our statistics have become richer and our predictions considerably more reliable.

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GOLOVANOV, YA., KOMSOMOL'SKAYA PRAVDA 13 Jul 76 p 4

[Question] As soon as we touch upon the problem of space medicine the word "weightlessness" appears. Your science could be called the "medicine of weightlessness"...

[Answer] This is not quite so. Space medicine does not study only the effects of weightlessness. However, since weightlessness is the strongest factor for which the organism is the least prepared, various problems of the influence of weightlessness on the human body occupy a quite significant place in our research.

[Question] What is being done in this area on "Salyut-5"

[Answer] Quite a lot. For example, we are studying the complex mechanism of the vestibular apparatus' operation. In order to do this a special instrument, the "Impul's" has been set up on board the station. Using electrical impulses of varying strength it determines the limits of excitability of the vestibular apparatus. Intensifying the impulses, the cosmonaut finally causes an illusion of careening, it seems to him that the Earth is falling out from under him. This threshold magnitude of the impulse can be compared with the threshold magnitude at the time of testing on Earth and definite conclusions can be made on the specifications of the functioning of the vestibular apparatus in weightless conditions.

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GOLOVANOV, YA., KOMSOMOL'SKAYA PRAVDA 13 Jul 76 p 4

Here is another interesting example. Both Soviet and American specialists have noted that the sensation of taste changes rapidly and markedly in space. The cosmonaut becomes indifferent to food which he had, until quite recently, liked, and begins to enjoy food which he had rarely eaten and sometimes did not even especially like. For example, a strong attraction for sharp seasonings has been noted and "Moldova" sauce is very popular in space. We decided to determine what was happening. This is difficult to do in view of the extremely broad spectrum of individual tastes. There is good reason for the saying: "In taste and colors there are no comrades." Cosmonauts suggested a unique taste standard, a specially impregnated paper with various degrees of sweet, bitter, sour, and salty tastes. We know the terrestrial reaction of cosmonauts. We are now attempting to determine how their tastes change.

In our first space flights we had a unique conflict with weightlessness. The very presence of weightlessness means, of course, that a body has no weight. It was very important to know, if, in the course of time, the cosmonaut was gaining or losing weight. In order to do this a unique scale for weightlessness, a massmeter, has been installed on the "Salyut-5." The small platform of the massmeter oscillates at a set frequency. If the cosmonaut places his body next to it, simply places his chest on the platform and attaches the straps, the frequency of oscillation changes. The changes in frequency determine the changes in the body's mass.

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GOLOVANOV, YA., KOMSOMOL'SKAYA PRAVDA 13 Jul 76 p 4

[Question] The solution of the problem of weightlessness's effects will be important in determining the length of space flights...

[Answer] The duration and the profitability! Medical problems are transformed into economic ones. If, for example, a flight lasts two weeks its efficiency is much lower than if it lasts two months. If it lasts a year, that is even better. After all the time for adaptation, unpacking equipment and preparing for descent changes very slightly and the time for work increases. The relative amount of productive labor, i.e., the efficiency of research itself, increases.

[Question] Let us fantasize a bit. How long will people be able to work in weightless conditions in the foreseeable future? Our readers frequently ask questions. Can one live in space for a year?

[Answer] Why not fantasize? Let us soundly examine what prevents people from making long stays in space. The muscles atrophy in weightlessness. The cardiovascular system loses tone and there are some metabolic disorders. The mechanisms of these changes are known and we know how to struggle against them and are doing so.

It is necessary to have training and to create loads on the body. Let us examine whether or not a person can, without damage to health, return to the world of gravity after, say, one year's work in space. It is known that the

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GOLOVANOV, YA., KOMSOMOL'SKAYA PRAVDA 13 Jul 76 p 4

ability to stand in a vertical position can be regained, true, with difficulty, by people who have been in bed three-five years. One can build an apparatus which, during the time of flight, will help restore the coordination which is lost in space. Obviously, weightlessness can present us with new surprises. There are data showing that bodily immunity to all sorts of disease is weakened. Nevertheless, I believe that in the near future the time limits for space flight will substantially increase.

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BULGARIA

GEORGIYEVA, I. V. and BAYEVA, R. Y., Institute of Genetics and Plant Breeding, Sofia

THE NATURE OF THE DISTURBANCES IN DIAKINESIS IN F_1 HYBRIDS BETWEEN TRITICALE FORMS AT THE SAME AND AT DIFFERENT PLOIDY LEVELS

Sofia DOKLADI BOLGARSKOY AKADEMII NAUK in English Vol 29, No 5, 1976 pp 731-734

[Abstract] Most researchers who study disturbances of meiosis of various forms of triticales and of triticales hybrids have begun work at metaphase; diakinesis, however, offers a promising light on these phenomena. The authors tabulate: 1) variation in the number of bivalents, univalents and chromosomes in F_1 hybrids and their parental forms of triticales; and 2) variation and ration of different types of bivalents in F_1 hybrids and their parental forms of triticales. It is concluded that disturbances in the course of diakinesis are of precisely the same order, both in hybrids of different and of equal chromosomal forms of triticales; also, that the physiology of the cells is probably disturbed on the whole, which causes partial or complete disappearance of pairing between certain chromosomes, leading to disturbances in the subsequent phases of meiosis, and, in the final amount, reduction in F_1 hybrid fertility. Figure 1; tables 3; references 6 Western.

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POPOV, P., GOTOV, K., and PANAYOTOV, I., Dobrudzhanskiy Agricultural Institute, Bulgaria

SOURCES OF RESTORATION OF FERTILITY WITH CYTOPLASMIC MALE STERILITY IN SELECTION OF HYBRID WHEAT

Moscow SEL'SKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian Vol 11 No 3 May/Jun 76 signed to press 26 Dec 74 pp 464-469

(Abstract) A major portion of this report reviews pertinent contributions by non-Bulgarian authors, especially Kihara, Muramatsu, Fukusawa (in the 50s and 60s), Gilmore et al. (1973), and Sasaki (1973). A brief summary of recent work in Bulgaria follows. The Institute of Wheat and Sunflower near Tolbukhin has been identifying sources of restorative capacity, and has proceeded along two research paths: i) location of R-sources for recently-discovered sterilizing types of cytoplasm, and ii) location of effective restorers for cytoplasm of T. timopheevi which is basic in selection work. References 35: 3 Russian, 32 Western.

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USSR

UDC 633.11:575.12:577.158

KABZHANOVA, S. B., Kazakh Scientific Research Institute of Farming imeni V. R. Williams, Alma-Ata

ISOZYME CONTENT OF PEROXIDASES OF HYBRID WHEAT GRAIN

Moscow SEL'SKOKHOZAZSTVENNAYA BIOLOGIYA in Russian Vol 11 No 2 Mar/Apr 76
signed to press 7 Jan 75 pp 286-288

(Abstract) The authors have traced the variability of peroxidase with respect to activity, composition, and relation to activity of isozymes in winter wheat lines and hybrids. Hybridization in wheat was found to be accompanied not only by qualitative changes in the electrophorograms of the peroxidases, the appearance of new "hybrid" isozymes, but also by quantitative changes in the relative activity of the constituents. Figures, 2; References 6: 1 Russian, 5 Western.

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USSR

UDC 636.577.3

BAKANOV, V. N., OVSISHCHER, B. R., and BONDAREVA, N. I., Moscow Agricultural Academy imeni K. A. Timiryazev

REGULATION OF PROTEIN METABOLISM IN DAIRY COWS USING VARIOUS SUPPLEMENTARY FEEDS DURING THEIR GRAZING ON CULTIVATED PASTURES IN A NON-CHERNOZEM ZONE

Moscow SEL'SKOKHOZAZSTVENNAYA BIOLOGIYA in Russian Vol 11 No 2 Mar/Apr 76
signed to press 18 Apr 75 pp 194-199

(Text-English language abstract supplied by authors) As a result of the application of fertilizers at the rate of N₁₂₀ and higher on sown pastures of the USSR non-chernozem zone pasture, feeds do not conform to cows' requirements in relation to protein and carbohydrates and content of some mineral substances. Such feeding results in a critical protein balance and decreases the utilization of nutrients and productivity. Supplementary feeding of cows with carbohydrate compound feeds, straw and mineral substances, which are deficient in the grasses, provides normal protein metabolism and improves the animals' productivity. Tables 3; References 7: 6 Russian, 1 Western.

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USSR

UDC 633.18:631.524.01

DZYUBA, V. A., All-Union Scientific Research Institute of Rice, Krasnodar Kray, Belozernoye

CORRELATION DEPENDENCE OF QUANTITATIVE CHARACTERISTICS OF RICE

Moscow SEL'SKOKHOZAYSTVENNAYA BIOLOGIYA in Russian Vol 11 No 2 Mar/Apr 76
signed to press 7 Oct 74 pp 226-229

(Text-English language abstract supplied by author) The author studied correlative dependence of 15 characteristics in 126 rice samples of three groups of duration of growing periods. He found a high correlation between the weight of a grain, number of spikelets and compactness of a panicle. The weight of grains from one panicle negatively correlated with the angle of inclination of a flag and the number of shoots. Chart 1; Table 1; References 5 (all Western).

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USSR

UDC 632.7.04/.08

OLESHCHENKO, I. N., IVASHCHENKO, I. I., and ADAMENKO, YE. A., North Caucasus Scientific Research Institute of Phytopathology, Krasnodar

BIOLOGICAL ACTIVITY OF SEXUAL FEROMONS IN CLICK BEETLE FEMALE

Moscow SEL'SKOKHOZAYSTVENNAYA BIOLOGIYA in Russian Vol 11 No 2 Mar/Apr 76
signed to press 30 Dec 74 pp 256-258

(Text-English language abstract supplied by authors) The authors have studied the sexual feromon in click-beetle females of the Agriotis genus (A. litigiousus, A. qurgistanus, A. reiteri and A. lineatus). They studied the dynamics of the secretion of the feromon and the distance of its effect in three beetle species (A. litigiousus, A. reiteri and A. qurgistanus). A possibility is discussed of the application of triglycerides as fixators of the feromon. Tables 2; References 10: 2 Russian, 8 Western.

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USSR

UDC 581.145.2:(633.11+633.14

KARPOV, B. A., Department of Storage and Technology of Agricultural Products
(Timiryazev Agricultural Academy)

MOISTURE CONTENT OF THE GERM AND ENDOSPERM OF WHEAT AND RYE GRAIN AT HAR-
VEST AND IN STORAGE

Moscow IZVESTIYA TIMIRYAZEVSКОЙ SEL'SKOKHOZYAYSTVENNOY AKADEMII in Russian
No 4 Jul/Aug 76 signed to press 19 Dec 75 pp 63-69

(Text-English language abstract supplied by author) It has been established that at the early gold ripe stage the moisture level of the germ is higher than that of the endosperm (difference is 10 to 15%). It decreases with maturity. At full maturity the germ may become drier than the endosperm (difference is 2 to 4%). Due to rainfall the germ becomes much wetter than the endosperm. In storage the germ of dry grain is drier than the endosperm (maximum difference 2 to 3%). On the contrary, the moisture level of the germ of wet grain can be higher than that of the endosperm (difference is 5 to 10%). Figure 1; Tables 5; References 7 (Russian).

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USSR

UDC 636.52/.58.088/31:636.084.52

IOTSYUS, G. P., KHLYSTOVA, L. F., and CHYONG VanDa, Department of Feeding
Agricultural Animals and Department of Poultry Farming (Timiryazev Agricultural Academy)

MEAT PRODUCTIVITY OF BROILERS FED WITH DIFFERENT FATS

Moscow IZVESTIYA TIMIRYAZEVSКОЙ SEL'SKOKHOZYAYSTVENNOY AKADEMII in Russian
No 4 Jul/Aug 76 signed to press 9 Aug 75 pp 182-190

(Text-English language abstract supplied by authors) Two experiments were conducted in the poultry house of the Timiryazev Agricultural Academy. When different fats (sunflowerseed oil-2; 7%, soy-bean oil-2%, technical animal fat-2; 7%) were added to the ration of chickens of Cornish breed (360 head) and White Plymouth Rock (330 head) the live weight of the cockerels of the experimental groups was 1.5--12.0% higher than that of the controls. The amount of feed and crude protein fed to obtain one kilo of gain was 3.3-10.5% and 9.7-16.0% less in the experimental groups respectively than in the control. The meat qualities and the quality of meat with respect to chemical composition, physical properties, biological value and palatability were higher in chicks of the experimental groups. Tables 7; References 18: 9 Russian, 9 Western.

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USSR

UDC 633.11.631.527.5

MIRYUTA, O. K. and KORCHINSKIY, A. A., Ukrainian Scientific Research Institute of Agriculture, Kiev

EFFECT OF INBREEDING AND CROSSBREEDING ON THE CHARACTER OF FERTILIZATION IN WINTER SOFT WHEAT

Moscow SEL'SKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian Vol 11 No 3 May/ Jun 76 signed to press 12 May 75 pp 354-359

(Text-English language abstract supplied by authors) The authors cite experimental data which show that a polygenic system which controls the selectivity of fecundation as a function of the homo- and heterozygous condition of its genes and their non-allelic interaction is a genetic ground of auto-regulation of the proportion of inbreeding and crossbreeding in wheat populations. With increase of homozygous disposition as a result of the successive inbreeding and selection, the priority in fecundation is assumed by the alien pollen, i.e., in inbred lines a significant increase of crossbreeding is observed. The reverse transition of the polygenic genetic system of control of fecundation into the heterozygous condition by means of single or double crosses results in preferential fertilization with gametes of the same origin. Tables 3; References 5 (Russian).

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USSR

UDC 632.937

NARZIKULOV, M. N. and UMAROV, SH. A., Institute of Zoology and Parasitology, Academy of Sciences Tadzhik SSR, Dushanbe

AGROBIOCOENOSIS, INFORMATION-REGULATORY PROCESSES AND INTEGRATED COTTON PEST CONTROL

Moscow ZHURNAL OBNCHHEY BIOLOGII AKADEMII NAUK SSSR in Russian, Vol 37, No 1, 1976 signed to press 18 Jun 75 pp 117-126

[Abstract] The protection of cotton from pests is a complicated biological problem which calls for use of the agrobiocoenotic approach. The relationship between the number of harmful species and the number of entomophages makes it possible to approach an effective use of pesticides--which, in combination with agrotechnical measures, offers a basis for integrating the whole effort of cotton pest control. Some advantages (both economic and biocoenotic) of such an integrated control in comparison with total use of chemical poisons are pointed out. References 26: 25 Russian, 1 Western.

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USSR

DZHAFARLI, F., Head of a Division of the Azerbaydzhan Scientific Research Institute of Plant Protection, candidate of biological sciences, NALBANDYAN, R., candidate of agricultural sciences, and ASKEROV, N., candidate of biological sciences, Kirovabad

IN THE INTERESTS OF EVERYONE

Baku BAKINSKIY RABOCHIY in Russian 18 Aug 76 p 2

[Text] Now, when some crops are being harvested and others are ripening, it seems to us that it is appropriate to mention the rules whose strict observance is in the interests of everyone--both those that grow and those that consume agricultural produce. It is a matter of a scientifically substantiated use of chemical plant protection agents.

Last October the plenum of the Central Committee of the Communist Party of Azerbaydzhan, which discussed the tasks of the republic's party organization for the fulfillment of the decree of the CPSU Central Committee and the USSR Council of Ministers "On Measures for the Further Intensification of Agricultural Production in the Azerbaydzhan SSR," mentioned a very impressive figure. Owing to pests and diseases we annually lose a large part of the harvest which according to the most modest calculations is estimated at 200 million rubles. The plenum stressed that an organization of an efficient service for protecting plants against pests and diseases based on the achievements of science and

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DZHAFARLI, F., NALBANDYAN, R., and ASKEROV, N., BAKINSKIY RABOCHIY 18 Aug 76
p 2

advanced practice and presupposing an obligatory implementation of protective measures in their full combination is a very important link in the intensification of farming.

The volume of production of chemical plant protection agents in the country during the Tenth Five-Year Plan will increase 1.4 times. A wide application of these preparations is due to their large assortment, rapid and highly efficient action and economic profitability. However, the chemical method also has shortcomings, that is, disruption in the natural and biological balance and pollution of the environment with toxic (poisonous) residues. Most preparations have the ability to accumulate in soil, water, plants and tissues of animals, poultry and fish.

The data of the Azerbaydzhan Scientific Research Institute of Plant Protection also convince us of this. In the harvest of cucumbers, tomatoes, onions, grapes, apples and cotton ready for picking we have found residual quantities of chemical preparations. When vineyards and orchards are treated with toxicants, grasses growing in interrows and usually fed to livestock are also contaminated. Our experiments have established that some preparations are carried away by air flows over quite significant distances (250 to 1,000 meters) from the place of treatment.

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What is the reason for the content of toxic residues, which can have an undesirable effect on the human body, in various environmental objects? First, an excessive use of chemical plant protection agents, which contradicts scientific recommendations. There are many farms where the norms and frequency of application of preparations are disrupted, that is, the doses of toxic chemicals and the number of treatments are increased arbitrarily and without substantiation. This condemned practice has not yet been fully eliminated and it is the duty of specialists to put an end to it. Second, the time interval between the last chemical treatment and the beginning of harvesting--the so-called waiting period--is not maintained. The periods have been established in a differentiated way depending on the preparation, agricultural crop and soil and climatic conditions. For example, the data of our institute attest to the fact that on vineyards and vegetable and cotton plantations of the Kirovabad-Kazakh zone and on the fruit orchards of the Kuba-Khachmas zone the waiting periods should last from 20 to 45 days.

Since according to scientists' forecasts the chemical method will remain the main tool in pest, disease and weed control in the next 20 to 30 years, much attention is given in the USSR and abroad to improving this method and a search
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is conducted for the safest and most effective application of preparations. The chemical method is combined with agrotechnical, biological and physical methods. Toxic agents are replaced with agents less poisonous for man and warm-blooded animals. Hormonal preparations possessing a fundamentally new mechanism of action are synthesized.

For the time being, however, in order to prevent environmental pollution and the accumulation of residues of chemical substances in food products, it is necessary to strictly adhere to the rules of application of preparations, that is, not to violate the doses and frequency of treatments, to observe waiting periods and to go out to fields only 2 or 3 days after chemical measures.

The Tenth Five-Year Plan is the five-year plan of the maximum improvement in the quality of output. It would seem that the responsibility for the quality of the harvest should be fully placed on direct producers. Following the example of the Ukraine and Moldavia, the time has come to introduce in Azerbaydzhan a procedure under which vegetables and fruits sold by kolkhozes and sovkhozes to the state are accompanied by a certificate--a document certifying the observance of the rules of application of chemical agents and guaranteeing the lack of toxic residues in agricultural produce. In our opinion, the development of interregional toxicological control laboratories as part of plant protection stations will contribute to the solution of this important task. A similar
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laboratory of this institute should undertake a methodological guidance of local laboratories and make analyses in an arbitration procedure (in disputable cases).

By common efforts we should and can make the chemical protection of plants against pests, diseases and weeds safe for man and the environment.

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USSR

UDC 633.18

GIN'KO, G. M., candidate of technical sciences, All-Union Order of Labor's Red Banner Institute for Agricultural Mechanization

THE BOND OF RICE GRAINS TO THE PANICLE

Moscow VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI in Russian No 6, Jun 76 pp 133-137

[Abstract] Measurements were investigated for harvesting awnless rice hybrid Krasnodarsky 424 and other varieties, Italika 3352 and Kenjo. Krasnodarsky 424 has recently been acclimated and is distinguished by high yield and net grain production. Combining procedures revealed that the bond of Krasnodarsky 424 grains was less strong than others; the necessary pull strength fluctuated depending on the number of panicles and was related to the characteristics of articulation as well as varietal features. Varieties with dense panicles had wider variations in needed combine pull strength than those with loose panicles. Results further indicated that the need for rice grains that would not be broken during combining by the combine drums was best provided by the varieties Krasnodarsky 424 and Champo, since the bulk of rice grains of these varieties were detached within the narrowest range of pull forces. Figures 2.

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USSR

UDC 633.14.324:631.559(476.5).003

PROKOPOV, P. YE., corresponding member Academy of Sciences Belorussian SSR, and
LAPKOVSKIY, A. A.

PRODUCTIVITY, CHEMICAL COMPOSITION, AND EFFICIENCY OF UTILIZATION OF WINTER RYE

Minsk DOKLADY AKADEMII NAUK BSSR in Russian Vol XX, No 7, Jul 76 pp 653-655

[Abstract] At the Ust'ye base, Belorussian Scientific Research Institute for Agriculture in Vitebsk Oblast the productivity of Khar'kovskaya 60 winter rye was tested during 1973-1974. The characteristics of the soddy-podzolic soil are given. The economic efficiency of winter rye depends on the height of the crop, its phase of development at harvest time and the methods of its utilization. There are two experiments. In the first rye is grown alone for fodder as an intermediate crop. Output is compared for shooting, pre ear forming, and ear formation stages. Protein content increases throughout the stages and cost per fodder unit decreases. In the second experiment, rye is grown for fodder in combination with alfalfa in one case and seradella (*Ornithopus sativus*) in the other, as second crops. Output in fodder units increases and prime cost decreases. Prime cost per fodder unit for the various cropping strategies are

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PROKOPOV, P. YE., LAPKOVSKIY, A. A., DOKLADY AKADEMII NAUK BSSR Vol XX, No 7,
Jul 76 pp 653-655

as follows: rye alone; for fodder in the shooting stage--1.20, pre ear formation--0.64, forming--0.50, rye for grain 4.11, rye for fodder in combination with alfalfa--0.38, in combination with seradella 0.38. (figures in rubles). It is not recommended to raise rye alone for fodder. Tables give detailed data on chemical composition, yields (expressed in various parameters) and cost, net income, and profitability. Tables 3; references 0.

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USSR

UDC 581.132

KORZH, B. V., All-Union Scientific-Research Institute of Plant Growing imeni Vavilov and All-Union Academy of Agricultural Sciences imeni Lenin, Leningrad

NEW DATA ON PHOTOSYNTHESIS AND GREEN PLANT RESPIRATION UNDER CONDITIONS OF PULSED (RATHER THAN CONTINUOUS) ILLUMINATION

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 227 No 4, 1976 signed to press 24 Sep 75 pp 1014-1017

[Abstract] The increased ability of green plants treated with pulsed irradiation to utilize the pulsed energy of the sun has long been known. However, the inertial quality of the recording equipment and of gas exchange in plants, has made it impossible to make direct measurements of photosynthesis or respiration rates under these conditions. Presented here is a suggested method for eliminating that inertial character; a number of experimental results are given. Figures 2; references 15: 7 Russian, 8 Western.

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USSR

UDC 575.23:633.11:547

MAMALYGA, V. S., and SHKVARNIKOV, P. K., Ukrainian Scientific-Research Institute of Feed, Southern Division of VASKHNIL, [All-Union Academy of Agricultural Sciences imeni Lenin] Vinnitsa, Institute of Molecular Biology and Genetics, Academy of Sciences Ukrainian SSR, Kiev

SOME CHARACTERISTICS OF THE INHERITANCE OF CHLOROPHYL MUTATIONS IN HARD SPRING WHEAT

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 229, No 4, Aug 76 signed to press 22 Mar 76 pp 987-989

[Abstract] Heterozygotes of lethal and subvital chlorophyll mutations show no effect of monohybrid heterosis; chlorophyll mutations may be caused by mutation of one or several genes controlling synthetic processes of chlorophyll. An assumption may be made that chlorophyll synthesis is controlled by various genes in various stages of the life cycle of a plant. The type of chlorophyll mutation is determined by the stage at which the mutation blocks the synthesis of pigments. Phenotypic expression of the mutation of genes in the nucleus may be mimicked by plastid mutations and chromosomal conversions. Table 1; references 7: 4 Russian, 3 Western.

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USSR

MEDVEDEV, P., doctor of biological sciences

ELITE WITH A MIXTURE

Leningrad LENINGRADSKAYA PRAVDA in Russian 8 Jul 76 p 2

[Text] This spring turned out to be very severe, drawn out and cold. Neither was the summer anything to be joyful about. The milk yield dropped sharply. Some specialists attempt to explain the difficult fodder situation by reference to natural adversities. However, the reasons are hardly restricted to this. Everything is linked to the organization of fodder production. In our oblast this work has been seriously lagging for a long time. The problem has not been completely and unilaterally dealt with. The plans for raising fodder for the oblast in general and for individual farms give thoroughly insufficient attention to the production of early green and succulent fodders.

With proper organization of production the share of early-ripening, fast-growing grasses should amount to at least 25 percent of the total perennial grass crop. However, this is not the case. Timothy [Phleum] dominates the grasses (25-30 percent). It ripens comparatively late and gives only one cutting. As a result, farms really start cutting hay only in July.

True, in recent years we have begun to expand the planting of cock's foot [Dactylis glommarata]. However, as they say, one swallow does not make a summer. The introduction of industrial methods of animal husbandry, and the construction of new complexes require that great attention be given to early fodder crops and to the organization of a sequence of green crops which will begin in the

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MEDVEDEV, P., LENINGRADSKAYA PRAVDA 8 Jul 76 p 2

middle of May and even earlier. This is especially important now, when, one after another, new fodder plants are going into operation which have equipment for the preparation of grass meal and which can operate in any kind of weather. They can be supplied with green fodder throughout the entire season only through a diverse assortment of special fodder crops which are distinguished by good winter resistance, cold resistance, early growing in the spring and sufficiently rapid reaching of the size for pasture and cutting. These, first of all, include reed grass [Phalaris arundinaceae], meadow foxtail [Alopecurus pratensis] and in some rayons awnless brome grass [Bromus inermis]. Reed grass and meadow foxtail are excellent in retaining spring moisture in the soil and in retaining temporary melt water flooding. Even this year by the middle of May they had obtained pasture ripeness (complete tillering) and by the end of the month they were ready for harvesting for early green dressing. At this time timothy, meadow fescue [Festuca pratensis], and cock's foot were considerably lagging behind these two grasses in their development.

Why have we failed to appreciate early ripening grasses? One can state that the reasons are purely subjective. Seed raising is given poor attention, there are no seeds.

This is all the more strange because SZNIISKH [Northwest Scientific Research Institute for Agriculture] has produced excellent varieties of early ripening

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grasses. The "pervenets" variety of reed grass was regionalized for three oblasts and the "serebristyy" variety of meadow foxtail was regionalized for six oblasts in the nonchernozem zone. We do not plant more of these varieties because the institute has, essentially, curtailed their primary propagation. While five years ago the varieties of reed grass and meadow foxtail were planted on 10-13 hectares each (to super elite and elite) on Belogorka experimental production farm of the institute, at the present time seed raising of the "serebristyy" meadow foxtail has been completely curtailed, and the area devoted to "pervenets" reed grass has been sharply reduced. Therefore, the delivery of elite seeds of these varieties has only amounted to 3-5 centners in recent years.

Thus, the institute has essentially withdrawn from participation in the solution of the task of their production, a task which is very important for Leningradskaya Oblast. Less Concern means a quieter life. This interesting trait characterizes the understanding of the fodder problem on the part of the department of seed raising of the institute. The oblast agricultural production administration recommended including in the plan for the raising of elite seeds at SZNIISK for 1976 the raising of 10 centners of "pervenets" reed grass seed and five centners of "serebristyy" meadow foxtail seed. What happened? The institute, by hook or crook, excluded the delivery of meadow foxtail elite from the plan. As for reed grass, it intends to obtain 10 centners of elite seed only by the end of the Five Year Plan.

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In order to eliminate the springtime difficulties it is necessary to immediately plan the annual raising of 25 centners each of "pervenets" and "serebristyy." In addition, in order to accelerate the production of commercial reed grass seeds it is essential to increase the area devoted to seed stock of this crop to 300 hectares and in following years to 500 hectares. Obviously, one of the firms engaged in the raising of perennial grass seed should also begin the production propagation of "serebristyy" meadow foxtail.

We have also shown slight concern for the cultivation of such a promising fodder crop as awnless brome grass. It has been planned to raise elite seeds for this crop on the educational farm of the Leningrad Agricultural Institute. However, the Institute fumbled the past Five Year Plan for raising seeds for this grass and is slowly correcting the matter this year. In the end, production of brome grass seed might be ready only by 1979.

The development of grass elite seed raising requires high agricultural standards and fields free of weeds. However, what can one say about the so-called "elite" cock's foot seed obtained from the Kalozhitsy experimental demonstration when they are almost half wheat grass [Agropyron]. In the final account an underestimation of the role of early fodder crops can lead to sad consequences. This problem must be solved quickly, using all available reserves.

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MEDVEDEV, P., LENINGRADSKAYA PRAVDA 8 Jul 76 p 2

In addition to accelerated propagation of early grasses, the raising of Jerusalem artichokes [*Helianthus tuberosus*], could be considered such a reserve. This is a good two harvest crop for our oblast. It annually produces a good crop of green foliage and tubers. With respect to the production of fodder units per hectare, the Jerusalem artichoke occupies one of the first places among forage crops. Its tubers are excellent for producing milk. It is rich in carbohydrates, protein, vitamins, and trace elements. Using it for feed, for example, in April, one can somewhat increase the production of milk and bring our oblast out of the springtime crises.

In the prewar years more than 1,500 hectares were devoted to this crop in our oblast. In the postwar years the area devoted to it has not exceeded 500 hectares, and sometimes almost none are planted.

SZNIISKH has produced two excellent high yielding varieties of Jerusalem artichoke; the "Leningradskaya," regionalized for our and Pskov Oblast, and the "severnnyy gibrid," which is undergoing state testing. However, the entire problem is that SZNIISKH has not only curtailed the selection of this crop but also the primary seed raising of the varieties which have been produced. It has done this instead of extensively and persistently introducing these varieties onto the fields.

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MEDVEDEV, P., LENINGRADSKAYA PRAVDA 8 Jul 76 p 2

The Sosnovskiy cowparsnip [*Heracleum*], the moraliy root, comfrey [*Symphytum*], and perennial buckwheat could be considered as reserves of early fodder. They are able to produce early green fodder by the middle of May. However, the institute places no hope upon these plants either. It was at one time a pioneer in the production of new fodder crops, but now it has fallen behind.

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USSR

LEVIN, G., candidate of biological sciences, scientific staff-worker at the Turkmen Experimental Station of VIR [All Union Institute for Plant Raising]

THE BLOSSOMING POMEGRANATE ORCHARDS

Ashkhabad TURKMENSKAYA ISKRA in Russian 14 Aug 76 p 4

[Text] Fruits play an important role in human nutrition as suppliers of biologically-active substances and carbohydrates. Not requiring cooking, they keep their health and dietetic qualities and therefore are an essential part of a rational diet.

In 1968, the USSR Council of Ministers' State Committee on Science and Technology approved optimal norms for the consumption of fruit per capita per year developed by the Institute of Nutrition of the USSR Academy of Medical Sciences. It consisted of 95 kilograms, and 113 when grapes were considered. The norms for the consumption of subtropical crops, which are more valuable with respect to their biochemical properties and have higher health-dietetic properties than fruits of the temperate zones, should amount to 6-7 kilograms per person per year.

At the present time the consumption of subtropical crops amounts to two kilograms per capita, including imports. The expansion of the production of these valuable products is an important State task, in which a large role can be played by our republic.

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There are now about 1,000 hectares planted to subtropical crops in Turkmeniya. However, the main territories of the subtropical zone, Southwest Turkmeniya (this is 20 percent of the subtropics in the USSR) still await development. When the Kara-Kum Canal brings its life giving waters to the expanses of the Meshkhed-Missarian Plains, then specialized subtropical crop sovkhozes will arise and extensive orchards of olives, pomegranates, almonds and other subtropical crops will expand. Their share of the fruit crops will rise from 5.5 to 13 percent. The valuable fruits will be easily obtained in the industrial centers of Turkmenistan and it will be possible to export large quantities to the nation's northern regions.

It is necessary to plan today for tomorrow's Turkmen subtropical crops. Prior to the arrival of water to the Meshkhed-Missarian Plains it is possible to increase the production of subtropical fruits through the more rational utilization of land in the mountain valleys of Kara-Kalinskiy Rayon. Workers at the Turkmen Experimental Station of VIR have calculated that here one can increase pomegranate production to 25,000 tons.

For more than 40 years the Turkmen Experimental Station of the All-Union Institute of Plant Raising at Kara-Kala has studied pomegranates. Here, in the Sumbara Valley, about 600 varieties have been brought together in the largest collection in Central Asia. The better varieties are being prepared for transfer

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to state variety testing. The variety regionalized for the republic was also recommended by the station for state testing.

The Turkmen Experimental Station of VIR is also engaged in pomegranate selection. Breeding plants for soft seeds is the basic selection task. At the present time the selector, N. I. Zaktreger, has selected 20 promising soft seed plants, including: Makhtumkuli, early VIR, soft seed pink, soft seed VIR-1, 2, 4, 5, and 6. They are being transferred for state testing. Tests are also underway on a number of elite seeds from very good tasting fruit: black rose, kolobok, cherry, and others. The varieties selected by the station are distinguished by high yields, and a large output of juice from the fruit, up to 45-55 percent.

It has been possible to select relatively frost-resistant fruit. These include the kazak-anor, salavatskiy, shakhnar, meykosh, the Afghan variety kunduzskiy, the American Californian 6506, the Uzbek kzyl anor, the Azberbaydzhanian zubeyd, the kara-bala myursal' and others. Soft seeded varieties of pomegranates are distinguished by reduced frost resistance.

In order to raise more of the varieties of pomegranates it is necessary to locate them in the warmest regions and, where there are frosts, to raise grapes and other crops.

The protection of pomegranates from predators and diseases, which in some years inflict considerable damage on the harvest, is a serious problem. G. A. Krasil'nikov, a worker at the Institute of Zoology at the Academy of Sciences
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USSR

LEVIN, G., TURKMENSKAYA ISKRA 14 Aug 76 p 4

of the Turkmen SSR, has developed a system of measures in the struggle against predators and diseases of the pomegranate. However, it must be improved.

The republic has experience in raising pomegranates on an industrial scale. In particular the Kara Kalinskiy Subtropical Sovkhoz has obtained yields of up to 100-150 centners per hectare on some plots. If high agronomic standards are observed, a hectare of pomegranate orchard can produce more than 5,000 rubles of profit.

The utilization of progressive experiments and achievements of science and the expanded planting of pomegranates will make it possible to supply the republic with sufficient quantities of this valuable fruit.

4/4

Bioacoustics

USSR

LIVSHITS, M.S., Gor'kiy State University imeni N.I. Lobachevskiy

SCANNING OF TERRAIN BY THE DOPPLER ECHO-LOCATOR OF RHINOPHIDAE

Moscow BIOFIZIKA in Russian Vol 21 No 4 Jul/Aug 76 signed to press 11 May 75
pp 730-734

(Abstract) The authors have previously described (Biofizika 19,739,1974) the physical basis of terrain scanning by the rhinophidae echo-locator, using a monofrequency portion of the sounding pulse. Terrain irradiation is achieved by the downward-directed radiation pattern lobe. Further studies on this problem are reported including calculation of the doppler modulation of the frequency during reflection of the pulse from an elementary sector of the terrain; also calculated were the magnitudes of the shift and of the deviation of frequency of the reflected signal during a known type of flight above the earth surface. Presence, in the frequency threshold curve of the rhinophidae auditory system, of a narrow-tuned filter in the location frequency region, and control of frequency of the sounding pulse

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USSR

LIVSHITS, M.S., BIOFIZIKA Vol 21 No 4 Jul/Aug 76 pp730-734

during flight, provide for response of the auditory system to the signal reflected from each point of the terrain. The resolving capacity obtained is calculated. A procedure is suggested for testing operation of the scanning system. Figures 3; References 7: 4 Russian, 3 Western.

2/2

USSR

UDC 616.036.882-07:612.013.7

SHUMAKOV, V. I., SHTENGOL'D, YE. SH., ITKIN, G. P., and ONISHCHENKO, N. A.,
All-Union Scientific Research Institute of Clinical and Experimental Surgery
of the Ministry of Health USSR; Department of Hospital Surgery of the
First Moscow Medical Institute imeni I. M. Sechenov; Scientific Research
Institute of Transplantation of Organs and Tissues of the Ministry of
Health USSR.

TOTAL ENERGY DEBT AS A MEASURE OF REVERSIBILITY OF TERMINAL STATES OF THE
BODY

Moscow VESTNIK AKADEMII MEDITSINSKIKH NAUK SSSR in Russian No 8 1976 pp 42-45

(Text-English language abstract supplied by authors) A formal approach to
the body as a regulation system enabled the authors to isolate the object
of regulation--cells and tissues, the regulator--the neurohumoral system
and executive mechanisms--the systems of circulation, respiration, excretion,
etc. Functioning of this model tends to remove energy deficit supervening
during the functioning of the body by detecting it with the aid of the
regulator and by changing regimes of work of the executive mechanisms.

1/2

USSR

SHUMAKOV, V. I., SHTENGOL'D, YE. SH., ITKIN, G. P., and ONISHCHENKO, N. A.,
VESTNIK AKADEMII MEDITSINSKIKH NAUK SSSR No 8 1976 pp 42-45

Removal of deficit leads to recuperation; further increase of energy
debt--to loss of stability and death. An automatic calculator has been
constructed for total oxygen debt, which characterizes stability of the
body during the terminal state. Figures 3; References 5: 4 Russian,
1 Western.

2/2

USSR

UDC 614.73:546.791]-07.612.015.31:546.791

CHERKASHINA, T. N., and PAVLOVSKAYA, N. A., Institute of Labor Hygiene and Occupational Diseases, Academy of Medical Sciences USSR, Moscow

DETERMINATION OF SMALL AMOUNTS OF URANIUM IN THE BIOLOGICAL MATERIAL IN PRESENCE OF THORIUM, ZIRCONIUM, TITANIUM, NIOBIUM, Σ REE AND A NUMBER OF OTHER ELEMENTS

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA (Labor Hygiene and Professional Diseases) in Russian No 8, Aug 76 signed to press 8 Sep 75 pp 37-40

[Text-English language abstract supplied by authors] A method of determining uranium in the biological material (muscle, internal organs) in the presence of Th, Zr, Ti, Nb, Al, Ca, Σ REE, and other elements is proposed. The essence of the method consists in the following: the biological material is mineralized with a mixture of acids (H_2SO_4 , HNO_3 and $HClO_4$), uranium is separated from the mineralized bulk through its coprecipitation with iron hydroxide, following which the interfering substances are coprecipitated by adding ammonium carbonate. Uranium (VI) is reduced to uranium (IV) with zinc and determined colorimetrically with arsenate (III) in 6 N HCl with respect to the non-reduced sample. The minimal-minimum determinable quantity of uranium is 1 μ g in the sample. Constant error is 20%, random error is $\pm 6\%$. Nb, Th, Zr, Ca, F, Σ REE, Al and also elements contained in the biological material do not interfere with the determination. Tables 2; references 5: all Russian.
1/1

USSR

UDC 577.3

SAKINA, N. L., OSTROVSKIY, M. A., SHARPATYY, V. A., and SMIRNOV, L. D., Institute of Chemical Physics, Academy of Sciences USSR, Moscow

EFFECT OF FREE RADICAL PROCESS INHIBITORS ON THE DARK- AND PHOTOINDUCED EPR SIGNALS OF THE MELANOPROTEIN GRANULES IN THE PIGMENTED EPITHELIUM OF THE EYE

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 29, No 4, Aug 76 signed to press 4 Mar 76 pp 1001-1003

[Abstract] The effect of inhibitors of free radical processes [IFRP] on dark- and photoinduced EPR signals was studied in an attempt to prove the "radical nature" of these signals; the IFRP was used as a sort of marker of free radical state. The EPR spectra of the suspension of melanoprotein granules [MPG] of the frog eye pigmented epithelium appeared as an asymmetric line with a g factor of 2003 both in the dark and with light. Illuminating a sample at room temperature increases the EPR signal by 30-60%; after light is extinguished the signal intensity returns to the original level. When the effect of IFRP was studied under both conditions, it was established that in the dark the amplitude of EPR signal was diminished by 60%. When illuminated, the relative increase of the EPR signal was 60% from MPG sample without the IFRP, but it was elevated by 200% in the experimental group with IFRP added. The nature of dark- and photoinduced paramagnetism should be studied in more detail. Figures 3; references 9: 6 Russian, 3 Western.
1/1

Biophysics

USSR

UDC 613.867-07:616.831-073.97

KARADZHOV, K. V., Institute of Labor Hygiene and Occupational Diseases Academy of Medical Sciences USSR, Moscow

CHARACTERISTICS OF THE BIOELECTRIC ACTIVITY OF THE CEREBRAL CORTEX UNDER CONDITIONS OF LOWERED PRODUCTIVITY OF MENTAL WORK

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA (Labor Hygiene and Professional Diseases) in Russian No 8, Aug 76 signed to press 3 Nov 75 pp 49-52

[Abstract] Investigation of the fluctuations and average frequency of the α -rhythm by means of frequency and spectral analyses yielded their quantitative and spectral characteristics. A relationship was established between the lowered productivity of mental work and changes in cerebral cortex biopotentials. The indexes of the lowering of average frequency and increasing the dispersion of the α -rhythm may be used as a criterion for evaluation of the bodily functional state. Figures 2; references 8: 7 Russian, 1 Western.

1/1

USSR

UDC 613.645:621.375.826

SEMENOV, A. I., Institute of Labor Hygiene and Occupational Diseases Leningrad

THE INFLUENCE OF LASER EMISSIONS ON THE BODY AND MEASURES OF PROPHYLAXIS

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA (Labor Hygiene and Professional Diseases) in Russian No 8, Aug 76 signed to press 30 Mar 76 pp 1-6

[Text-English language abstract supplied by author] Laser radiation can produce in the organism both local and general functional changes. As evidenced, the most susceptible to injury is the eye. Experimental investigations demonstrated that with a multiple action on the organ of vision at low energy levels there can be observed the effect of cumulation that manifests itself in growing structural changes in the irradiated tissues. Under the action of the laser emissions on the organ of vision multifarious functional shifts arise in the organism, whose intensity depends in a large measure on the parameters of the active factor and the reactivity of the organism, as well as on general hygienic conditions. Of prime importance in the complex of prophylactic measures is the protection of the eyes. No tables or figures; references 9: all Russian.

1/1

SHUVALOV, V. A., KLIMOV, V. V., KRAKHMALEVA, MOSKALENIO, A. A. and KRASNOVSKIY, A. A., corresponding member, Academy of Sciences USSR, Institute of Photosynthesis, Academy of Sciences USSR Institute of Biochemistry imeni A. N. Bakh, Academy of Sciences USSR Pushchino, Moscow Oblast; Moscow

PHOTOCONVERSION OF BACTERIOPHEOPHYTIN IN THE REACTION CENTERS OF RHODOSPIRILLUM AND CHROMATIUM MINUTISSIMUM

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 227, No 4, 1976 signed to press 12 Dec 75 pp 984-987

[Abstract] Research on the primary photoprocesses taking place in reaction centers is quite necessary for an understanding of the conversion of the energy of light quantum during photosynthesis; yet this problem remains beset with a number of uncertainties. The present approach was to study the effect of charges on the spectrum of bacteriopheophytin (charges from the primary donor and the electron acceptor), to arrive at an indicator of the localization of pigments in the reaction center; also to study the possibility of the photo-restoration of bacteriopheophytin contained in the centers at low reduction-oxidation levels of the medium. Figures 3; references 15: 6 Russian, 9 Western.

1/1

USSR

UDC 581.185.3:574.6:591.5

YELIZAROV, YU. A., Department of Entomology, Moscow State University

MORPHOFUNCTIONAL CHARACTERISTICS OF THE CHEMORECEPTOR ORGANS OF INSECTS

Moscow ZHURNAL OBSHCHEY BIOLOGII AKADEMII NAUK SSSR in Russian Vol 37, No 1, 1976 signed to press 28 Apr 75 pp 103-116

[Abstract] The chemoreceptor organs of insects possess many qualities which in the past few years have strongly attracted the attention of physiologists, particularly those working on bionic problems. Given here are some examples of unusually high sensitivity in insects' chemoreceptor organs to certain odors and to substances with contact action. The authors take up the special features of the ultramicroscopic structure of the olfactory organs, and the contact-action organs in comparison with those of vertebrates. The question of the specificity of the sensitive sensillae cells is discussed (to certain chemical substances having definite significance in the biology of the species). Some criteria of specificity, associated with enzymatic action of the membrane proteins of the sensitive cells are set forth; and a concept is given of the generalized specialized canals for conducting excitation in the central nervous system of the insect, during excitation of the olfactory receptors. Figures 8; references 48: 13 Russian, 35 Western.

1/1

USSR

UDC 628.356

VASIL'YEV, V. B., and VAVILIN, V. A., Institute of Water Problems,
Academy of Sciences USSR, Moscow

MATHEMATICAL MODELLING OF BIOLOGICAL TREATMENT OF SEWAGE WATERS IN AN
ACTIVATED SLUDGE SYSTEM

Moscow ZHURNAL OBSHCHEY BIOLOGII in Russian Vol 17 No 3 May/Jun 76 signed
to press 20 May 75 pp 427-439

(Text-English language abstract supplied by authors) Mathematical modelling of the processes of biological decontamination of sewage waters provides possibilities for optimization of sewage treatment plant design. The purpose of a mathematical model is first of all a description of microorganism growth and substrate consumption time courses. The classic models by Monod, Herbert, Ierusalimsky, and others, have formal character and take into account only the most general phenomena, such as microorganism growth and death or the inhibition effect of high substrate concentration and metabolic products. The simplest model for an ideal plug flow aeration calculation is that of Monod, while an even simpler model of the first order can be adequately used

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USS R

VASIL'YEV, V. B., and VAVILIN, V. A., ZHURNAL OBSHCHEY BIOLOGII Vol 17
No 3 May/Jun 76 pp 427-439

for calculations of an ideal complete-mixing continuous flow. The optimization of the airtank-sediment trap system requires improved models allowing for the dependence of the system parameters on the activated sludge properties, especially on the sludge age. The sludge age affects both the microorganisms growth and the sludge sedimentation process. The use of old models corrected for parameter dependence on the sludge age is proposed. Figures 3; References 30: 6 Russian, 24 Western.

2/2

USSR

UDC 576.8:591.556:591.524.1

AMBRAZENE, ZH. P., Republic Laboratory of Water Research, Ministry of the Water Economy, Lithuanian SSR, Vil'nyus

QUANTITATIVE RELATIONSHIPS OF MICROORGANISMS AND THEIR USE IN EVALUATION OF RIVER WATER POLLUTION

Moscow ZHURNAL OBSHCHEY BIOLOGII in Russian Vol 17 No 3 May/Jun 76 signed to press 17 Oct 75 pp 416-426

(Text-English language abstract supplied by author) Correlation and regression analyses of the data obtained during field studies of water from 33 rivers revealed close relationships between individual physiological groups of microorganisms participating in the organic matter decomposition ($r = 0.5-0.9$). There were also close correlations between physiological groups of microorganisms and the chemical and hydrobiological indices of the organic matter concentration in water ($r=0.4-0.8$). A linear relationship was found between the microbial count and the organic matter concentration. An evaluation system for river water pollution using 9 microbiological indices has been evolved. A classification of water pollution in 4 grades (corresponding to 4 saprobic zones) is proposed based on quantitative relationships between individual groups of microorganisms. The proposed classification facilitates assessment of both the sanitary-epidemiological condition of a water-body and the degree of its pollution with organic substances. Tables 3; References 32: 15 Russian, 17 Western.
1/1

USSR

UDC 628.37 + 632.153

DODOLINA, V. T., and KUTEPOV, L. YE., candidates of agricultural sciences, and ZHIRNOV, B. F., candidate of biological sciences, All-Union Scientific Research Institute for Agricultural Utilization of Waste Water

PERMISSIBLE LEVELS OF ORGANIC MATTER IN WASTE WATERS INTENDED FOR IRRIGATION

Moscow VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI in Russian No 6, Jun 76 pp 110-113

[Abstract] Agricultural use of water has increased from 25 km³ in 1963 to 164 (projected) in 1980, and irrigated land in the USSR has reached about 90,000 hectares. Since 1968 research has been conducted at the institute relating to chemical substances in waters and their residues in the soil and in plants, as well as effects of such organic substances on growth and harvests. Gas chromatography was used to establish such residues of acetaldehyde in light chestnut soils used for corn, a mixture of aldehydes in chernozem used for potatoes, light chestnut soils used for sorghum, and dichlorethanes on podzol soils used for perennial grasses. Results indicated that certain aldehydes decomposed rapidly and were not found in plants, while certain others, as acetaldehyde, were fixed in potatoes through natural metabolism. Acceptable concentration of the tested substances in water to be used for irrigation were 300 mg/l of acetaldehyde, 100 mg/l of crotonaldehyde, 100 mg/l of benzaldehyde, 500 mg/l of cyclohexanone, 500 mg/l of cyclohexanol, and 50 mg/l of dichlorethane. Tables 5; references 4 (Russian).
1/1

USSR

UDC 616.006.6-092:541.4

KURLYANDSKIY, B.A., doctor of medical sciences, and MEDVEDOVSKIY, A.G., candidate of medical sciences, Toxicological Laboratory of the Sanitary Epidemiological Station of Moscow City

METHOD OF QUANTITATIVE ESTIMATION OF THE DANGER OF CHEMICAL CARCINOGENIC EFFECTS

Leningrad VOPROSY ONKOLOGII in Russian Vol 22 No 7 1976 pp 67-72

(Text- English language abstract supplied by authors) A formula for quantitative estimation of the degree of blastomogenic activity of chemical substances is suggested, in which blastomogenic activity of the substance (C) is directly proportional to the total number of names of tumor-involved organs in experimental animals (T) and the relative frequency of carcinogenesis $100 \times \left(\frac{n}{N} - \frac{n_1}{N_1} \right)$, and is inversely proportional to the logarithm of an

effective carcinogen dosage mg/Kg/1g ED₅₀, the latent period of tumor development (L) in days, and the total number of the names of tumor involved organs in control animals (T₁):

1/2

USSR

KURLYANDSKIY, B.A., VOPROSY ONKOLOGII Vol 22 No 7 1976 pp 67-72

$$C = \frac{T}{L \cdot \lg ED_{50} \cdot T_1} \left(\frac{n}{N} - \frac{n_1}{N_1} \right) \times 100$$

where n is the number of experimental tumor-bearing animals, n₁ the number of control animals with tumors, N the number of experimental animals surviving the first tumor appearance, N₁ the number of control animals surviving the first tumor appearance. Numerical values are given for four classes of blastomogenic activity of chemical compounds according to "C" criterion. Class I--extremely high > 0.5, class II--high 0.499-0.1, class III--moderately high--0.099-0.05, class IV--low < 0.05

2/2

USSR

UDC 613.6:622.673.1]-07:612.766.1

SHEVTSOVA, V. M., Institute of Labor Hygiene and Occupational Diseases Krivoy Rog

THE STATE OF MAJOR PHYSIOLOGICAL FUNCTIONS OF LOADING MACHINES OPERATORS AT IRON ORE MINES WITH MANUAL AND REMOTE CONTROL

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA (Labor Hygiene and Occupational Diseases) in Russian No 8, Aug 76 signed to press 18 Jul 75 pp 43-45

[Abstract] An analysis was performed on the performance of remote control and direct control of loading machines. It has been found that remote control does not change the air contamination level, noise level nor illumination but does lead to removal of the vibrational effects. Remote control keeps the operator at a distance of 5-6 m from the loading machine, permits him to move freely, at about the same loss of energy. No specially undesirable effects were noted with remote control. After the initial adjustment the processes became routine, with some improvement in the concentration of the operator and faster nerve reactions. Figure 1; references 6: all Russian.

USSR

UDC 595.121 Tetrabothriidae 592/599:011.4

MURAV'YEVA, S. I. and POPOV, V. N., SIMFEROPOL' STATE UNIVERSITY

TAXONOMIC STATUS AND CONTRIBUTION TO THE ECOLOGY OF ANOPHRYOCEPHALUS
SKRJABINI (CESTODA, TETRABOTHRIIDAE) A PARASITE OF PINNIPEDS

Moscow ZOOLOGICHESKII ZHURNAL Vol 55 No 8 Aug 76 pp 1247-1250

(Text-English language abstract supplied by authors) On the basis of structural patterns of scolex and distal parts of female genitalia, the diagnosis of the genus *Anophryocephalus* Baylis, 1922 is established. *Pusa hispida* and *Phoca vitulina largha* from the Sea of Okhotsk and the Bering Sea and *Histiophoca fasciata* from the Sea of Okhotsk are registered as final hosts of *A. skrjabini*. A suggestion is put forward to the effect that the final hosts are infected from crustaceans of the family Euphausiidae. Figure 1; Tables 3; References 7: 5 Russian, 2 Western.

ROMANIA

UDC 613.2:576.882.28.097.29

GALEA, V. and BARA, A., Oncological Institute, Cluj-Napoca

DETERMINATION OF AFLATOXINS IN FOOD PRODUCTS

Bucharest IGIENA in Romanian No 2, 76 pp 123-128

[Abstract] Thin-layer chromatographic analyses of widely-used food products indicate that improper storage can result in infestation with mold and aflatoxins. Out of 34 cheese samples only a few, evidently mold-infested, gave a positive reaction for aflatoxins. Mycotoxin migrates from the mold-infested rind toward the inner section at approximately 0.5-1 cm. Out of 52 grain samples not one gave a positive reaction if the product was not mold-infested. However, bread stored in plastic bags developed, in about 5 days, a polyform mold in which Aflatoxin B₁ was identified. Tests on fruit and fruit products did not give positive reactions for aflatoxin. In only one case, in plum pulp for the distillation of brandy, the reaction was positive. Moreover, tests on beer showed the complete absence of mycotoxins. It is concluded that under normal conditions of food flow there is no risk of aflatoxin infestation. Tables 4; references 12.

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USSR

UDC 663.53.533+663.18

LOBANOK, A. G., STAKHEYEV, I. V., LATYSHEVA, S. G., and VAZHINSKAYA, I. S.,
Institute of Microbiology, Academy of Sciences Belorussian SSR

CULTIVATION OF *PENICILLIUM DIGITATUM* 24P, A PROTEIN-PRODUCING FUNGUS, IN
LABORATORY FERMENTERS

Minsk VESTSI AKADEMII NAVUK BSSR, Seryya Biyalagichnykh Navuk in Belorussian
No 3, 1976 pp 35-37

[Summary] *P. digitatum* 24P grown in oscillating flasks produces a biomass with a large amount of protein. A study was made to determine the relationship between cultivation conditions, biomass, and protein synthesis in five-liter fermenters. Aeration conditions were worked out by inoculation of a four-percent 72-hour culture; cultivation lasted 24 hours. Regardless of the degree of mixing, the amount of biomass increased along with the aeration rate, but only up to a point. Maximum accumulation occurred at the rate of 1.0 liters per liter of medium per minute; increasing the amount of air had a negative effect. Protein synthesis showed a different pattern. With mixing speeds of 200 and 400 rpm the maximum protein synthesis also occurred at the aeration rate of 1.0 liters per liter per minute. With the rpm raised to 600, maximum protein accumulation in the mycellium occurred at 0.5 liters per liter per minute. This latter rate was therefore selected. Fermenters were inoculated

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USSR

LOBANOK, A. G., STAKHEYEV, I. V., LATYSHEVA, S. G., and VAZHINSKAYA, I. S.,
VESTSI AKADEMII NAVUK BSSR No 3, 1976 pp 35-37

with 2-, 4-, 6-, and 10-percent 72-hour cultures. Again the cultivation lasted 24 hours. The amount of inoculum did not affect the biomass but noticeably affected the protein quantity. To increase the latter it is advisable to introduce a six-percent culture in five-liter fermenters. Biomass and protein accumulation were noticeably affected by the age of the culture. Cultivation for 72 hours led to more biomass and less protein. Using a younger culture (36 to 48 hours) promoted vigorous protein synthesis and at the same time reduced the biomass. On the basis of these data, subsequent parameters were determined using a six-percent 48-hour culture. The selected aeration and inoculation dosage conditions permitted the dynamics of the biosynthesis to be studied. Up to the 48th hour, both biomass and protein increased in parallel; at the 60th hour protein accumulation reached its maximum while the biomass began to decline, amounting to 8.5 grams per liter. Microscopy of the mycellium showed the decrease in biomass to be due to autolysis. On the basis of the data, cultures were cultivated in fermenters for 48 hours to determine the output of biomass and protein on other cultures involving potato wastes. The use of nutrients based chiefly on cell fluid, juice water and pulp, and cell fluid and pulp showed that cell fluid is the best medium for biomass and protein output.

2/3

USSR

LOBANOK, A. G., STAKHEYEV, I. V., LATYSHEVA, S. G., and VAZHINSKAYA, I. S.,
VESTSI AKADEMII NAVUK BSSR No 3, 1976 pp 35-37

Varying the potato wastes in the nutrient had little effect on the accumulation of biomass but considerable effect on the protein content. Optimal conditions in five-liter fermenters, therefore, are these: aeration rate--0.5 liters per liter per minute; mixer operation--600 rpm; amount of inoculum--six percent; age of inoculum--48 hours. Subsequent research will use larger-capacity fermenters. Figure 1; tables 3; references 3 (Russian).

3/3

USSR

Editorial

MICROBIOLOGICAL INDUSTRY

Moscow EKONOMICHESKAYA GAZETA in Russian No 32, Aug 76 p 1

[Abstract] Predictions for the next Five Year Plan are being made. The plan calls for 2.3 times larger production of yeasts for enrichment of feed, 2.7 times greater production of complex feed additives and 3.7 times increased production of plant protective agents. At the same time, 1.8 more capital investment is to be made for construction of new plants and modernization of equipment. Effort also will be expanded to increase the content of protein in yeasts and vitamin concentrates and to search for new, cheaper crude materials. On the basis of the first six months of 1976, all goals have been successfully achieved. Figure 1, no tables or references.

1/1

USSR

UDC 615.9:632.95].615.43

DMITRIYEVA, O. V., Department of Industrial Hygiene, Ryazan' Medical Institute
imeni academician I. P. Pavlov

EFFECT OF A COMBINATION OF PESTICIDES ON THE ENZYME SYSTEMS OF INDIVIDUALS
USING THEM

Moscow SOVETSKAYA MEDITSINSKAYA in Russian No 6, 1976 signed to press 19 Jul
75 pp 132-135

[Abstract] Examination of 132 agricultural workers who came in contact with pesticides (59 who handled organochlorine and organophosphorus compounds for 10 years or more, and 73 who were exposed in addition to organomercury compounds) revealed persistent changes in blood acetylcholinesterase, lactate dehydrogenase, and sulfhydryl groups. Acetylcholinesterase, for example, was significantly inactivated (21 to 25% of the control). The effect was more pronounced in those who used all 3 types of pesticides. The red and white blood cell count, hemoglobin concentration, and ESR were found to be within normal limits. Hence an analysis of blood, compared to the determination of acetylcholinesterase, is not a sensitive indicator of health and consequently of little value in periodic medical checkups of farm workers. Table 1; references 6 (Russian).

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USSR

UDC 615.917:547.412.133].07:616.36-092

ROTENBERG, YU. S., and SERBINOVSKAYA, N. A., Municipal Sanepidstation Moscow

SOME REGULARITIES DISTINGUISHING THE REACTION OF THE LIVER BIOENERGY SYSTEMS
IN SUBLETHAL AND THRESHOLD EFFECTS

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA (Labor Hygiene and Occupational Diseases) in Russian No 8, Aug 76 signed to press 2 Oct 75 pp 41-43

[Abstract] It has been shown that a single sublethal poisoning with CCl_4 leads to a development of a phased reaction of breathing system and oxidative phosphorylation, identical quantitatively to the dynamics of chronic intoxication, manifested by a short lasting activation followed by depression, supercompensation and return to normal. Single administration of CCl_4 at the Lim_{ac} level leads to the development of reduced reaction in which the activation period is somewhat stretched, and there is no supercompensation. Finally the reaction of the liver to a single administration of CCl_4 at a dose of 50 mg/m^3 consists of extended activation reaction. Tables 3; figure 1; references 16: 12 Russian, 4 Western.

1/1

USSR

UDC 613.632:615.285.7]-07:[616.127-008.934.55+
+616.127-008.921.8]-074

SAIDKARIMOV, S. K., and KHALIKOV, T. R., Institute for the Advanced Training of Physicians, Tashkent

INVESTIGATION OF THE STATE OF CARBOHYDRATE-PHOSPHORUS METABOLISM IN THE HEART MUSCLE IN CASE OF CHRONIC POISONING WITH A MIXTURE OF PESTICIDES

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA (Labor Hygiene and Professional Diseases) in Russian No 8, Aug 76 pp 53-55 manuscript received 22 Aug 75

[Abstract] In cases of chronic intoxication with a mixture of lindane and phosphamide, there occurs in the heart muscle a lowering of the content of ATP and glycogen on the background of a depression of the activity of phosphorylase and increase in hexokinase activity; the glycolysis rate remains unchanged. Chronic intoxication with this mixture of pesticides is accompanied by a sharp elevation of the lactic acid content in blood; the level of pyruvic acid and the stability of glucose level remain unaffected. Table 1; references 11: 10 Russian, 1 Western.

1/1

USSR

UDC 616-003.219

SHURUBURA, A. A., PETRASH, V. V., VOINOV, V. A. and DANILOV, YE. N., Leningrad Scientific Research Institute of First Aid imeni I. I. Dzhanelidze; All-Union Institute of Pulmonology, Leningrad

IMPEDANCE DETERMINATION OF GAS BUBBLES IN THE BLOOD ARISING WITH REDUCTION OF ATMOSPHERIC PRESSURE

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 227, No 4, 1976 signed to press 19 Nov 75 pp 1021-1024

[Abstract] According to present-day concepts, decompression produces the formation of gas bubbles in the organism, given a certain degree of supersaturation of blood and tissues with gas. However, not one of the existing theories of decompression disorders is absolutely verifiable, since problems of the initial development of gas bubbles reaching visible dimensions remain undecided. This study determined the total amount of gas bubbles in several types of blood (human, dogs); impedance was taken as the definitive factor. Results show that during the process of rapid lowering of barometric pressure of the surrounding air, gas bubbles may indeed be formed in the blood; these bubbles serve as a basis for the formation of microthrombi, which arise on account of denaturation of plasma proteins, and of the adhesion of blood platelets and lipids to the surface of the bubbles. Figures 3; references 14: 6 Russian, 8 Western.

1/1

USSR

UDC 612.2

KOLCHINSKAYA, A. Z., MISYURA, A. G., PSHENICHNYY, B. N., ONOPCHUK, YU. N., MARCHENKO, D. I. and SHEVYELO; Laboratory of the Physiology of Human Respiration, Institute of Physiology imeni A. A. Bogomolets and Institute of Cybernetics, Ukr SSR, Kiev

A STUDY OF THE DYNAMICS OF THE PROCESS OF GAS TRANSFER IN THE ORGANISM WITH USE OF A MATHEMATICAL MODEL

Leningrad FIZIOLOGICHESKIY ZHURNAL SSSR imeni I. M. Sechenov in Russian Vol 62, No 7, 1976 pp 1047-1055

[Abstract] Until very recently the study of gas transfer has been conducted along two quite disparate lines--the first based on the method proposed by Doublas and Holden, the second on the principles suggested by I. M. SECHENOV, BOHR, KROG, ROMER and some other classical investigators. This paper proposes a mathematical model of the process of the mass transfer of gases within the body, which will make possible a study of the dynamics of that process in the course of the respiratory cycle. Graphs illustrate the variations in the rate of motion and partial pressures of both respiratory and of inert gases in alveolar air, the blood of pulmonary capillaries, the arterial and venous blood, the blood of the tissue capillaries, and of the tissues in a stable condition and in transition regimes from rest to muscular activity, from conditions of normal to

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USSR

KOLCHINSKAYA, A. Z., MISYURA, A. G., PSHENICHNYY, B. N., ONOPCHUK, YU. N.,
MARCHENKO, D. I. and SHEVYELO, FIZIOLOGICHESKIY ZHURNAL SSSR Vol 62, No 7,
1976 pp 1047-1055

increased and to decreased pressure. Quantitatively, an estimate can be made
of mass gas transfer of the respiratory regimes, resistance in the breathing
pathways, area of diffusion surface, and related parameters--over 90 in all.
Figures 4; references 31: 18 Russian, 13 Western.

2/2

USSR

UDC 612.886+612.243+612.846

BOKHOV, B. B., SHPAYER, YE. YA., and ASATURYAN, V. I., Moscow

ORIENTING MOVEMENT OF RATS IN A ROTATING SYSTEM

Leningrad FIZIOLOGICHESKIY ZHURNAL SSSR (Physiological Journal of USSR) in
Russian Vol 62, No 8, Aug 76 signed to press 8 Apr 75 pp 1124-1129

[Abstract] In experiments with rotating of rats, their avoidance response was
studied: rats moved into the central portion. The 7° or 15° pitch of the
central portion's walls caused significant moving of the rats towards a square
peripheral portion. When experimenting in darkness, the moving-to-center
response was restored, while under illumination the preference of the peripheral
portion was again revealed in the rats. The data obtained are regarded as con-
firming the hypothesis that the moving-to-center response during rotation is
due to discrepancy between the vestibular and the visual systems of coordinates
in peripheral portions of the centrifuge. Figure 1; tables 3; references 7:
3 Russian, 4 Western.

1/1

USSR

UDC 612.115

YERMOLAYEV, YU. A., Laboratory of the Development of Vegetative Functions, Scientific Research Institute of Physiology of Children and Adolescents, Academy of Pedagogical Sciences USSR, Moscow

EFFECT OF HYPOTHALAMIC ELECTRIC STIMULATION ON THE PROCESSES OF THROMBOCYTES AGGREGATION

Leningrad FIZIOLOGICHESKIY ZHURNAL SSSR (Physiological Journal of USSR) in Russian Vol 62, No 8, Aug 76 signed to press 25 Aug 75 pp 1158-1165

[Abstract] Stimulation of hypothalamic ventromedial and posterior nuclei via implanted electrodes was followed by phasic changes of the blood coagulation processes and thrombocyte dynamic functions. Within the first minutes after stimulation, an increase of the blood coagulation potential, of aggregation and adhesive features of thrombocytes was observed, replaced later by reduction of thrombocyte dynamic features and by decreasing blood coagulation potential. The above changes are associated with alteration of the blood content of aggregating agents, inhibition of aggregation, and blood coagulating factors. The hypothalamic structures are suggested to exert control over thrombocyte hemostatic functions via a humoral link. Figures 5; references 24: 15 Russian, 9 Western.

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USSR

UDC 612.115 + 612.015.32 + 612.85

DERYAGINA, G. P., SINITSYNA, T. S., and VESELOVA, T. V., Laboratory of Clinical and Experimental Cardiology, Institute of Physiology imeni I. P. Pavlov, Academy of Sciences USSR, Laboratory of Cardiovascular Pathology, Institute of Experimental Medicine, Academy of Medical Sciences USSR, Leningrad

EFFECT OF SOUND STIMULATION ON LIPID METABOLISM, PARAMETERS OF THE BLOOD COAGULATING SYSTEM, AND DEVELOPMENT OF EXPERIMENTAL ATHEROSCLEROSIS IN RABBITS

Leningrad FIZIOLOGICHESKIY ZHURNAL SSSR (Physiological Journal of USSR) in Russian Vol 62, No 8, Aug 76 signed to press 6 Nov 75 pp 1171-1181

[Abstract] A 14-day sound stimulation of healthy rabbits increases the level of unesterified fatty acids and the blood coagulability. Morphologically, the hyperthrophy of the heart coronary arteries and necrotic foci in the myocardium are revealed. In rabbits with experimental atherosclerosis subjected to sound stimulation during 14 and 28 days, in spite of a high level of lipids in the blood and hypercoagulatory shifts, the developing conditions aid in resorption of lipids from aortal plaques and coronary arteries. Apart from that, morphological studies reveal hyperthrophy and edema of the vascular wall, necrotic foci, and local and diffuse fatty infiltration of the myocardium. Figures 5; tables 3; references 23: 16 Russian, 7 Western.

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USSR

UDC 612.822.3

GODUKHIN, O. V., PETUKHOV, V. V., and POPOV, L. A., Laboratory of the Structure of Synapses and Their Functions and Laboratory of the Analysis of Complex Processes, Institute of Biophysics, Academy of Sciences USSR Pushkino-on-Oka

INFORMATIONAL SIGNIFICANCE OF EVOKED ELECTRIC ACTIVITY

Leningrad FIZIOLOGICHESKIY ZHURNAL SSSR (Physiological Journal of USSR) in Russian Vol 62, No 8, Aug 76 signed to press 19 May 75 pp 1240-1243

[Abstract] Separation of evoked responses from various brain structures according to given criteria showed a direct relationship between the structures of neo- and archcortex such as optical cortex, contralateral optical cortex, somatic cortex and the fields CA-1 and CA-3 of the hippocampus; this is expressed by synchronous generation of a given component of evoked response in those structures. No such relation was noted in evoked responses from external geniculate body, lateral thalamic nucleus, reticular formation of the middle brain, reticular thalamic nucleus. Concurrent appearance of a "marker" component throughout a rather large area of the brain necessitates postulation of some single center for its generation. Solution of this problem, however, is an entirely new research task. Figures 3; references 7: 4 Russian, 3 Western.

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USSR

UDC 612.172 + 612.45

PSHENNIKOVA, M. G., MATLINA, E. SH., and MEYERSON, F. Z., Laboratory of Heart Pathophysiology, Institute of General Pathology and Pathophysiology, Academy of Medical Sciences USSR, and Laboratory of Humoral-Hormonal Regulation, All-Union Scientific Research Institute of Physical Culture, Moscow

EFFECT OF STRESS EXERCISE ON THE LEVEL OF CATECHOLAMINES IN THE MYOCARDIUM OF RATS ADAPTED TO HIGH ALTITUDE HYPOXIA

Leningrad FIZIOLOGICHESKIY ZHURNAL SSSR (Physiological Journal of USSR) in Russian Vol 62, No 8, Aug 76 signed to press 22 Sep 75 pp 1251-1254

[Abstract] A stress created by 7 hrs swimming leads to a sharp drop of the concentration of adrenaline and noradrenaline in the myocardium of the left ventricle in intact rats. When the animals are adapted to moderately high altitude hypoxia, this drop is totally avoided. The mechanism of this needs to be studied further. An assumption was made that increased resistance of sympathetic-adrenal systems in the adapted animals may be connected with lowering of the sensitivity of afferent link and even of the system itself. Table 1; figure 1; references 16: 10 Russian, 6 Western.

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USSR

UDC 362.147:331.76

SIDNEV, G. V., candidate of medical sciences, and LEBEDEV, G. P., Pripyat' Municipal Hospital, Kiev Oblast

ANALYSIS OF THE EFFECTIVENESS OF MEDICAL CHECKUPS OF INDUSTRIAL WORKERS

Kiev VRACHEBNOYE DELO in Russian No 6, 1976 pp 144-146

[Abstract] The authors propose a method of evaluating the health of a worker or group of workers that takes into account the presence or absence of chronic diseases, sick leave, results of functional and laboratory tests, etc. All the individuals are divided into 5 categories according to their health status (apparently healthy, in a state of stable compensation of functions, in a state of unstable compensation of functions, in a state of moderate decompensation of functions, in a state of pronounced decompensation of functions) after a year of observation. An increase or decrease in the number of individuals in categories 4 and 5 after certain given intervals is indicative of improvement or deterioration of the health of the group monitored. A variation of the method involves a point system, with each health category rated 1 to 5 points. The latter are multiplied by the relative frequency of the category in a given group and the results are summed. The resulting sum reflects the health of the group. The integral evaluation of health in categories or in points (for a group) is more objective and, therefore, more reliable than data on temporary disability or subjective judgments. Tables 4.

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USSR

UDC 616.12-008.331.1-036.2(47+57) "1960-1972"

KHOTSANOV, L. K., professor, Moscow

ANALYSIS OF THE DIFFERENCES IN THE PREVALENCE OF HYPERTENSION AMONG WORKERS IN THE MAIN BRANCHES OF INDUSTRY AND CITIES OF THE UNION REPUBLICS FROM 1960 TO 1972

Kiev VRACHEBNOYE DELO in Russian No 6, 1976 pp 119-126

[Abstract] Study of the incidence of hypertension from 1960 to 1972 showed that it slowly declined in the Soviet Union as a whole and in the RSFSR during the last 3 years but not in the other union republics. Moreover, the rates varied considerably from one republic to another, being more than 3.5 times as high in Azerbaydzhan and Tadzhikistan as in the Ukraine and Lithuania. The sick rates were affected not so much by the nature of the industry, production technology, or working conditions as by climatic and geographic factors, eating habits, customs, mode of life and its rhythm, and ethnic composition of the population. The article also discusses the possible relationship between chemical, noise, climatic, genetic, and other factors and incidence of hypertension. Figure 1; table 1.

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USSR

UDC 591.524.1:001.57

SUKAL'SKAYA, S. YA., LIKHTAREV, I. A., and MASHNEVA, N. I., Leningrad Scientific Research Institute of Radiation Hygiene, Ministry of Health RSFSR, and MOISEYEV, A. A., Department of Radiation Hygiene of the Central Order of Lenin Institute for the Advanced Training of Physicians, Ministry of Health USSR, Moscow

MATHEMATICAL MODELLING OF THE BEHAVIOR OF STRONTIUM 90 IN A WATER-FRESH WATER FISH SPAWN SYSTEM IN SOME SPECIFIC INSTANCES OF RADIOACTIVE CONTAMINATION OF A WATER BASIN

Moscow ZHURNAL OBSHCHEY BIOLOGII in Russian Vol 17 No 3 May/Jun 76 signed to press 13 Mar 75 pp 459-470

(Text-English language abstract supplied by authors) A two-compartment model for ^{90}Sr exchange in the "water-fresh water fish spawn" system is proposed. Systems of differential equations are examined which describe kinetics of ^{90}Sr accumulation in and elimination from the fish spawn in some most likely to occur situations of aquatic environment radioactive contamination. Theoretical calculation results have been compared to those of experimental studies of the time course of ^{89}Sr accumulation and retention. The proposed model can be used not only for data interpretation but also for designing further experiments. Figures 6; Tables 3; References 24: 20 Russian, 4 Western.

USSR

UDC 636.539.11

YAKOVLEVA, V. P., Institute of Biophysics, Moscow

BIOCHEMICAL INDICES FOR THE BLOOD SERUM OF CATTLE UNDER THE INFLUENCE OF NUCLEAR FISSION PRODUCTS

Moscow SEL'SKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian Vol 11 No 3 May/Jun 76 signed to press 4 Nov 74 pp 449-452

(Text-English language abstract supplied by author) The biochemical picture which characterizes the condition of protein, carbohydrate, fatty, mineral metabolism and pigment function of liver was evaluated in the blood sera of cows which received products of uranium-235 of 9.5--10 hours' age (FP). The observed animals displayed a subacute radiation sickness. There was the suppression of the transaminase activity of blood caused by dystrophic transformations in tissues of heart and liver. The increase of the indices of lipid metabolism is probably a sequence of the hypofunction of thyroid gland. The increase of the content of protein-bound carbohydrates in the blood serum of radiated cows was observed only at the period of the expressed clinical picture of the subacute radiation sickness. The decrease
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USSR

YAKOVLEVA, V. P., SEL'SKOKHOZYAYSTVENNAYA BIOLOGIYA Vol 11 No 3 May/June 76

of the amount of iron in the blood serum was accompanied with the decrease of the concentration of hemoglobin, the content of potassium and sodium remaining changeless as well as the pigment function of liver. Figure 1; References 21: 16 Russian, 5 Western.

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USSR

UDC 576.36

DUBININ, N. P., academician, DUBININA, L. G., and SHANAZAROVA, A. S., Institute of General Genetics, Academy of Sciences USSR, Moscow

STRUCTURAL CHROMOSOME MUTATIONS IN THE SECOND CELL CYCLE DURING RADIATION AND CHEMICAL MUTAGENESIS

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 228, No 2, May 76 signed to press 8 Dec 75 pp 467-469

[Abstract] Transfer of structural mutations of chromosomes into the second cell cycle is connected with genetic mechanisms such as autoreproduction and the effect of nucleases on free chromosome breaks. This paper reports on the characteristics of surviving and recovering chromosome changes in the second cell cycle. In case of radiation mutagenesis survival of chromosome type aberrations was shown to be 100%. With chemical mutagenesis survival decreases. The effect of radiation and of alkylating compounds in general as well as in respect to individual types of mutations is specific for each of them. Table 1; figure 1; references 12: 10 Russian, 2 Western.

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SEVAN'KAYEV, A. V., ZHERBIN, YE. A., LUCHNIK, N. V. and OBATUROV, G. M.;
Scientific-Research Institute of Medical Radiology, Academy of Medical Sciences,
USSR, Obninsk, Kaluga Oblast

RELATIVE EFFECTIVENESS OF FAST AND INTERMEDIATE ELECTRONS IN THE DETECTION OF
CHROMOSOMAL ABERRATIONS IN HUMAN LYMPHOCYTES

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 227, No 4, 1976 signed to
press 3 Nov 75 pp 975-977

[Abstract] The quite limited data now available on the genetic effects of intermediate neutrons would lead us to expect the existence of certain laws which are impossible to predict by means of simple extrapolation from results obtained from other studies. Meanwhile, the growing availability of reactors for use in medicine demand a knowledge of the basic parameters of the biological action of neutrons of various different energies. The present study was based on the irradiation of human lymphocytes by electron fluxes of mean energy of 0.35 Mev (intermediate) and 0.85 Mev (fast). Data were obtained on the relative biological effectiveness of intermediate and of fast neutrons, in respect to gamma-radiation from ^{60}Co , and in respect to each other; various absorption spectra and kinetic patterns relating to photoinduced changes in absorption were also obtained. Figure 1; table 1; references 9: 3 Russian, 6 Western.

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BULGARIA

Unattributed

COMBATING ALCOHOLISM--AN IMPORTANT TASK FOR BULGARIAN NEUROLOGISTS AND PSYCHIATRISTS

Sofia NEVROLOGIYA, PSIKHIATRIYA I NEVROKHIRURGIYA in Bulgarian Vol 15, No 3, 1976 pp 161-163

[Abstract] In January 1976 the Central Committee of the BCP and the State Council of the People's Republic of Bulgaria issued a decree on "Main Lines of State and Public Temperance Activity" for the purpose of intensifying the campaign against alcoholism and smoking. The Council of Ministers' Decree No 25 of 30 March 1976 defines the tasks of state and economic agencies and organizations for implementation of the January 1976 decree. The Ministry of Public Health and the Central Committee of the Health Workers Trade Union took measures for this purpose in February 1976. Bulgarian neurologists and psychiatrists are required to do the following:

1. Expand and improve health propaganda and educational activity. The Scientific Institute of Neurology, Psychiatry and Neurosurgery of the Medical Academy and the Section for the Prophylaxis and Treatment of Drug Addicts have the task of providing scientific and methodological direction for the

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BULGARIA

Unattributed, NEVROLOGIYA, PSIKHIATRIYA I NEVROKHIRURGIYA Vol 15, No 3, 1976 pp 161-163

Council on Alcoholism and Smoking Problems of the Institute of Health Education.

2. Train the necessary personnel in problems of the prophylaxis and treatment of alcoholism and smoking.
3. Expand and improve therapeutic and prophylactic activity (screening methods, consulting offices for the prophylaxis and treatment of drug addicts, neurological departments in psychiatric hospitals, special-purpose hospitals for alcoholics and other drug addicts).
4. Expand and improve scientific research on the basic problems in the prophylaxis and treatment of alcoholism.
5. Improve the cooperation between psychiatrists and neurologists and okrug, city and rayon temperance committees.

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USSR

UDC 616.133.33+616.145.13-07

PELEKH, L. YE. and MITYUK, A. G., Chopskaya Rayon Hospital, Zarkarpatskaya Oblast, Rehabilitation Department, Kiev Institute for the Advanced Training of Physicians

CLINICAL MANIFESTATIONS OF CEREBROVASCULAR DISEASE IN RELATION TO ENVIRONMENTAL FACTORS

Kiev VRACHEBNOYE DELO in Russian No 6, 1976 pp 47-51

[Abstract] Study of the case histories of 464 patients with different forms of arterial hypertension who sought medical care in a hospital in Uchgorod Rayon, Zakarpatskaya Oblast of the Ukraine in 1973 and 1974 showed that most of those with stage 1 of the disease felt well during spring and summer but suffered exacerbations in fall and winter. The most common complaints in cold weather were malaise, general weakness, headache, pulsation in the temples, vertigo, and unsteady gait. The response to medication--hypotensives, vasodilatives, and tranquilizers--was good. Patients with advanced forms of hypertension tolerated both warm and cold weather poorly. An analysis of 6721 emergency calls to rescue squads in 3 Ukrainian cities (Beregovo, Vinogradovo, Mukachevo) from 1970 to 1974 for stroke, angina pectoris, hypertensive crisis, and myocardial infarction revealed that most were made during months with abrupt changes in meteorological conditions--December, January, February, 1/2

USSR

PELEKH, L. YE. and MITYUK, A. G., VRACHEBNOYE DELO No 6, 1976 pp 47-51

March, and August. Sudden increases in the relative humidity and atmospheric pressure prompted the most calls for aid. Table 1; references 7 (Russian).

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YUGOSLAVIA

KOCJAN, L., doctor, Scientific Advisor, Ljubljana

AVIAN TUBERCULOSIS STILL DANGEROUS FOR MAN AND THE DOMESTIC AND WILD ANIMALS

Belgrade VETERINARSKI GLASNIK in Serbo-Croatian No 6, Jun 76 signed to press 25 Nov 75 pp 565-567

[Abstract] In recent years most of the Yugoslav work on avian tuberculosis has been done in Vojvodina. Largest number of patients diagnosed with Mycobacterium avium during the period 1970-1972 in Yugoslavia was at the institute in Sremska Kamenica. The veterinary service in Vojvodina has been developing poultry tuberculinization. Fresh serum agglutination test has proved to be a more simple and accurate method in diagnosing avian tuberculosis than the tuberculin test. The annual report of the International Health Organization for 1973 revealed that Poland, Czechoslovakia, Hungary, Bulgaria, and Yugoslavia had only sporadic cases, while in Rumania the incidence of avian tuberculosis was relatively high. Austria, Italy, West Germany showed low incidence as compared to Luxembourg. Denmark reported avian tuberculosis was fairly common among seagulls. Report of incidence of avian TB and slaughtering of the infected animals are mandatory in all these countries. Our bimonthly bulletin for the period 1-15 April 1975 reports the presence of avian TB on ten farms, an obvious indication that the battle against avian TB is still a critical task. References 6: 3 Serbo-Croat, 3 English (FAO).

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USSR

OKUN'KOV, P. S.

PREVENT ANIMAL POISONING

Moscow VETERINARIYA in Russian No 6, Jun 76 pp 28-29

[Abstract] Numerous toxicants are potential hazards for livestock. Mishandling of pesticides against rodents, and use of zinc phosphide, are often causes of poisoning for swine and fowl. Mercury compounds have caused problems in numerous Soviet republics, while nitrogen fertilizers have at times accumulated to dangerous levels in plants used for feed. The same is true for nitrites and nitrates. Various efforts, including laboratory research into waters, feeds and pathological materials, are being undertaken to prevent these cases of poisoning. Maximum limits are being established for residual amounts of pesticides in feeds, and new veterinary methods are being devised for diagnosing poisoning of animals, fishes and bees. Several developments are foreseen in scientific disciplines, including independent courses on toxicology in all veterinary schools, seminars for specialists in all republics and in smaller administrative units, etc. Yet deficiencies remain, such as the tendency to concentrate on analysis of possible trouble only after suspected poisoning,

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USSR

OKUN'KOV, P. S., VETERINARIYA No 6, Jun 76 pp 28-29

rather than prophylactic measures, and a paucity of objective, quick, and precise methods for identifying harmful substances in organs and tissues of animals. An important task to be accomplished relates to countermeasures against animal and fungus pests of pasturelands. All measures against possible toxic situations must be given greater publicity.

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USSR

UDC 619:616.988.21:615.372

BUCHNEV, K. N., ROSLYAKOV, A. A., KVASOV, I. L., and SEDOV, V. A.

ANTI-RABIES VACCINE FROM THE ALMA-ATA ZOOLOGICAL-VETERINARY INSTITUTE

Moscow VETERINARIYA (Veterinary Medicine) in Russian No 8, Aug 76 pp 45-46

[Abstract] The antirabies vaccine from Alma-Ata Zoological-Veterinary Institute is completely and highly immunogenic for cattle and sheep. A single application of this vaccine results in development of intense immunity against rabies lasting at least 14 months; it shows a definite effect also against the intracerebral infection. Revaccination of the immunized animals after 14 months leads to a rapid--5-10 days--immunological reaction, the humoral antibodies surpassing the postvaccination level by a 5-10 fold excess. Table 1; figure 1; no references.

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USSR

BELOUSOVA, R. V., and SYURIN, V. N.

STUDY OF VIRUSES ECOLOGICALLY CONNECTED WITH BIRDS

Moscow VETERINARIYA (Veterinary Medicine) in Russian No 8, Aug 76 pp 46-50

[Abstract] A review type article citing authors and publications by years, but without specific publication details (e.g. journals, pages). One of the more important conditions for occurrence of viral diseases is the ever increasing density of the hosts-carriers. Chronic latent forms of the infectious agents are important in transmitting the disease to new regions and in preservation during interepizootic periods. Migrant birds play an important role in these processes, as evidenced in a number of studies. They can harbor several types of viruses, the virulence of which may even be built up or changed to new forms by the appearance of new recombinants. No tables, figures or references.

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USSR

UDC 619:616.988.21-036.2

VEDERNIKOV, V. A., All-Union Institute of Experimental Veterinary Sciences,
and SEDOV, V. A., State Veterinary Administration Ministry of Agriculture USSR

CURRENT CHARACTERISTICS OF THE EPIZOOTOLOGY OF RABIES

Moscow VETERINARIYA (Veterinary Medicine) in Russian No 8, Aug 76 pp 57-61

[Abstract] The spread of natural rabies infection depends on the population density and migration intensity of wild carnivorous animals, mainly foxes and raccoons. In areas where these animals can develop freely, stable disease foci may develop. Among the measures that could be used for controlling seasonal variation of disease incidence, one can include extension of the killing zone for wild carnivorous animals and planned control of animal population in general. Registration of all cases of rabies incidence should be initiated with proper dissemination of available information. Finally, public education is an important control measure. Figures 4; no tables or references.

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USSR

PASHKOV, V., Main Veterinary Physician, Veterinary Administration, Ministry of Agriculture Tadzhik SSR, BARATOV, SH., Senior Scientific Staff Worker, Institute of Zoology and Parasitology, Academy of Sciences Tadzhik SSR

IN ORDER TO PREVENT REDUCTIONS IN PRODUCTIVITY

Dushanbe KOMMUNIST TADZHIKISTANA in Russian 3 Aug 76 p 2

[Text] The tasks of increasing the production of animal products require extensive work in the sanitization of farms. The warbler fly [Hypodermatidae] infestation (hypodermatosis) is the most widespread economically damaging infestation in animal husbandry. The veterinary service has widely fought warbler flies. As a result, the infestation of livestock by larvae has been reduced by a factor of 25. Animal husbandry farms in Kurgan Tyubinskiy, Kumsangirskiy and Shaartuzskiy rayons have been almost completely freed of hypodermatosis, and in Gissarskiy, Yavanskiy and certain other rayons in Leninabad Oblast, where large horned cattle are maintained in stalls, the infestation of warbler flies does not exceed 1-3 percent.

Planned and scientifically-based, anti-warbler fly measures will help improve the quality of unprocessed hides. Over a five year period the number of large horned cattle hides infested with warbler flies that have been delivered to the Gissarskiy hide processing plant has been reduced by half.

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USSR

PASHKOV, V., BARATOV, SH., KOMMUNIST TADZHIKISTANA 3 Aug 76 p 2

Unfortunately, managers and zooveterinary specialists on a number of kolkhozes and sovkhoses are not sufficiently serious about the struggle against hypodermatosis. On many farms in Fayzabadskiy, Garmskiy, Komsomolabadskiy, Dzhirgatal'skiy and other rayons in Kulyabskaya Oblast, there are violations of the deadlines for checking infestations and for treating large horned cattle. Valuable anti-warbler fly drugs are inefficiently utilized, and preventive treatment of cattle is not carried out to the full extent, especially for cattle in the private sector.

There is a high infestation rate for livestock sent to summer pasture. This is one of the reasons for reductions in milk yield and lack of weight gain among young cattle and especially for the deterioration of the quality of unprocessed hides. Kolkhozes and sovkhoses in the republic annually fail to earn up to 500,000 rubles simply because of the downgrading of hides.

The veterinary specialists of the state veterinary system, kolkhozes and sovkhoses now have sufficiently highly effective anti-warbler fly drugs such as chlorphos and hypodermine-chlorophos. Scientists and specialists have made recommendations, visual aids, and have worked out a five year integrated plan of organizational, economic, and special measures in the struggle against warbler fly infestation of large horned cattle.

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USSR

PASHKOV, V., BARATOV, SH., KOMMUNIST TADZHIKISTANA 3 Aug 76 p 2

This plan should be implemented, it is possible to do this. With the creation of interfarm associations a large number of livestock have been transferred to stalls. This simplifies mass anti-warbler fly treatment and creates a real possibility for the complete eradication of warbler flies from some farms.

Now, during the summer period it is important to protect livestock from female warbler flies, which lay eggs on the hair and skin of livestock. This is injurious to livestock pasturing conditions. During the season of the flight of the warbler fly farms underfullfill the milk yield norms by an average of 50 kilograms per cow and fattening cattle weight gain is 30 kilograms below norm. During this period of mass flight of the warbler fly it is necessary to build shade tents or summer sheds and keep livestock in them during the hot hours. Where there are no sheds livestock should be driven under trees, into the shade of cliffs or river terraces.

Livestock pasturing in open areas during this time should, every seven days, be washed with a one percent water solution of chlorophos, using 1.5-2 liters per head.

The efficiency of anti-warbler fly measures depends to a great extent on their proper and timely organization. Every farm should compile a plan for

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USSR

PASHKOV, V., BARATOV, SH., KOMMUNIST TADZHIKISTANA 3 Aug 76 p 2

treatment, acquire anti-warbler fly drugs and application equipment. It is essential that all large horned cattle, irrespective of ownership, be subject to anti-warbler fly treatment.

Extensive help should be given to specialists by managers of kolkhozes and sovkhoses and also by executive committees of kishlak [village] soviets. The complete protection of animals from warbler fly infestation will assist in further increasing the production of meat and milk and in improving the quality of unprocessed hides.

4/4

Publications

USSR

LISOVSKIY, V. P., candidate of biological sciences

REVIEW OF FEED ADDITIVE HANDBOOK

Moscow VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI in Russian No 6, Jun 76 pp 149-150

[Review by V. P. Lisovskiy of the book SPRAVOCHNIK PO KORMOVYM DOBAVKAM (FEED ADDITIVE HANDBOOK) edited by K. M. Solntsev, corresponding member of the V. I. Lenin All-Union Academy of Agricultural Sciences (VASKhNIL) and published by the academy, Minsk, 1975]

[Abstract] A major contribution to modern animal feeding methods and feed varieties has come from the Byelorussian SSR. Broad testing and experimentation have been conducted to provide balanced and efficient rations, and results have been published extensively. The Feed Additive Handbook published in 1975 has systematized that information and provided a retrieval system, thus facilitating application of the research. Dr. Solntsev was assisted by academician V. N. Bukin of the Academy of Sciences of the USSR, Academician A. P. Dmitrochenko of VASKhNIL, Academician A. R. Val'dman of the Latvian Academy of Sciences, and others. The 16 chapters of the handbook deal with vitamins, enzymes, amino acids, hormones, macro- and trace elements, antibiotics, non-protein nitrogen substances, premixes, protein-vitamin-mineral additives, and 1/2

USSR

LISOVSKIY, V. P., VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUK No 6, Jun 76 pp 149-150

other synthetic preparations. Unfortunately, the size of the edition (not stated) is small.

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USSR

PROSKURYAKOVA, N. B. and KALYUZHNA, L. D. [Reviewers]

HYGIENIC BACTERIOLOGY AND VIROLOGY OF WATER RESERVOIRS

Kiev MIKROBIOLOGICHNYY ZHURNAL in Ukrainian Vol 38, No 3, May/Jun 76 pp 390-391

[Review of book "Sanitarnaya Bakteriologiya i Virusologiya Vodoyemov" by L. V. Grigor'yeva, Moscow, Meditsina, 1975, 192 pages]

[Abstract] The above book reviews the contemporary problems of the hygienic bacteriology and virology in the reservoirs on the basis of literature data and the author's own research. The book contains six chapters. Chapter 1 presents general characteristics of the reservoir microflora, self-purification processes of the water, with emphasis on the biological self-purification. Chapters 2, 3 and 4 are devoted to various aspects of reservoir water infestation with pathogenic bacteria and identification of these bacteria. Chapter 5 discusses the survival rate of pathogenic and hygienically-significant microorganisms in reservoirs. The survival rate of viruses and pathogenic bacteria is presented in Chapter 6 on the basis of the most recent results obtained by the author and some Western scientists. Each chapter is divided

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USSR

PROSKURYAKOVA, N. B. and KALYUZHNA, L. D., MIKROBIOLOGICHNYY ZHURNAL Vol 38, No 3, May/Jun 76 pp 390-391

into sections describing different aspects of the subject discussed. A special section is devoted to test procedures of reservoir water for microflora during the flowering time.

2/2

BEHAVIORAL SCIENCES
Engineering Psychology and Ergonomics

ROMANIA

UDC 613.644:616.28-008.14-057

BERDAN, C., Antiepidemic Health Center, Bucharest

STUDIES ON NOISE AND SPECIFIC OCCUPATIONAL DISEASES IN INDUSTRIAL WORKERS

Bucharest IGIENA in Romanian No 2, 76 pp 91-98

[Abstract] Surveys on noise in 23 industrial enterprises of the textile sector and machine building industry and of 3,012 workers exposed to noise identified jobs in which this pollutant exceeds sanitary limits, especially in the area of high frequencies. The resulting significant occupational risk involves alterations of the auditory capacity which are stabilized and irreversible and are related to the length of occupational exposure and the specific working conditions of the job. The results of the surveys pointed out the need for combating noise and its effects on the human system, in the first place by a set of technical measures which must begin in the stage of designing of the shops and equipment and proceed to individual protective factors involving adequate audioprotectors. Concurrently, medical supervision must be intensified by study of noise sources, objectivization of the acoustic pressure and the upgrading of prophylactic medical examinations at the time of prehiring medical examinations and of the periodic medical checkups.

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BERDAN, C., IGIENA No 2, 76 pp 91-98

Tests of phonic acoumetry, audiometric examination, and unification and quantification of the criteria for evaluating auditory deficiencies must be included. Tables 5; references 19.

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ROMANIA

UDC 612.766.1.014.49

NEGOESCU, R., Institute of Hygiene and Public Health, Bucharest

EXPERIMENTAL MODELS OF INFORMATIONAL CHARGING IN BIOERGONOMICS

Bucharest IGIENA in Romanian No 2, 76 pp 81-89

[Abstract] The author reviews the results of experimental simulation of optimal and suboptimal rates of informational loading for the purpose of selecting the psychophysiological indicators which are the most appropriate in applied research. The tests were conducted in the morning on 20 male students aged between 22 and 28 (average age 22.7), healthy subjects. The results show that the human system copes with mental loading of an optimal level and average length (1 hour) under conditions of optimal biological efficiency. Symptoms of saturation and premonitory signs of fatigue at the end of the test indicate that in similar working systems, the interval, after which the establishment of breaks prevents the deterioration of the performance and discomfort for the subjects, is below 2 hours. Identically long suboptimal charging, as a result of the conflict between chronic substimulation and vigilance required by the random structure of the load, develops a condition of tension which becomes more acute at the beginning of the last quarter of the interval. This condition is induced by decrease in cerebral activation after the requirements of the performance, and demands employing a number of ergonomic measures after 1 hour. Figures 8; references 7.

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ROMANIA

MANU, P., department of occupational medicine, Medical-Pharmaceutical Institute, Bucharest

ERGONOMICS AND OCCUPATIONAL MEDICINE

Bucharest IGIENA in Romanian No 2, 1976 pp 65-74

[Abstract] The evolution of ergonomics is surveyed. The author analyzes the biological and physiological concept of ergonomics and points out its characteristic as interdisciplinary activity between the field of designing and the field of human sciences. The two major facets of activity of ergonomists are discussed. They so far focus on approaches to modify working conditions, the work environment, redesigning of machines (therapeutic ergonomics), on the one hand, and on the other hand, preventive ergonomics which advocates that ergonomic principles and standards and the problems of human factors be taken into consideration during the designing stage. The relationship between ergonomics and occupational medicine is also discussed. Emphasis is placed on the role of occupational medicine in helping ergonomics to demarcate the working conditions which are harmful to human structure. The role of the factory physician and occupational medicine expert and his activity in the application of ergonomic standards are pointed out. References 19.

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Yugoslavia/USSR

UDC 007.52

TOMOVIC, R., Belgrade, Yugoslavia

USE OF VARIABLE KINEMATIC STRUCTURE IN CONTROL OF SKELETAL MOVEMENTS

Moscow AVTOMATIKA I TELEMEXHANIKA in Russian No 6 Jun 76 signed to press
17 Mar 75 pp 117-124

(Text-English language abstract supplied by author) Control of multivariable mechanical systems such as functional motor activity in animal or man is considered. Another area of application is the design of anthropomorphic robots for medical and industrial purposes. It is shown that available mechanical degrees of freedom in the skeleton are not used simultaneously. Instead, constraints leading to variable kinematic structures are imposed depending on the desired functional activity. Thus the task of the control system is greatly reduced at the dynamic level. Logical control at the higher level takes care of instants when and how the kinematic structure must be modified. Means to describe mathematically systems with variable kinematic structure are presented as well as experimental results. Figures 5; Tables 2; References 7: 1 Russian, 6 Western.

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USSR

UDC 613.6:[629.113:008

PLYASUNOV, A. K., TKACH, A. N., and KALYAKOV, A. A., Institute of Hygiene, Kuybyshev

SCIENTIFIC-TECHNICAL PROGRESS AND SOME PROBLEMS OF OCCUPATIONAL HYGIENE AT THE VOLGA 50th ANNIVERSARY OF THE USSR AUTOMOBILE PLANT

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYE ZABOLEVANIYA (Labor Hygiene and Professional Diseases) in Russian No 8, Aug 76 signed to press 15 Oct 76 pp 10-12

[Text-English language abstract supplied by authors] In the example of the Volga Automobile Plant one can see the way in which scientific-technical revolution in this country leads to radical positive changes in technology and work conditions. It would, however, be an error to consider that technical reconstruction of industrial enterprises will have sufficed to completely eliminate adverse industrial and occupational factors. New technology and equipment, especially in view of their technical and hygienic incompleteness, can continue to be a source of occupational hazards and, in some cases, cause the appearance of new unfavorable factors. This is confirmed by hygienic research work carried out at the Volga Automobile Plant and points to the need for a comprehensive and thorough study of technology, organization and conditions of work existing at this plant so as to reduce and eliminate the

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USSR

PLYASUNOV, A. K., TKACH, A. N., and KALYAKOV, A. A., GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA No 8, Aug 76 pp 10-12

effect of adverse factors on the workers, to bring out and extend positive hygienic practices to other motor-car building plants. No figures, tables or references.

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USSR

UDC 613.65"5"

SMIRNOV, K. M., and AKHMETSHIN, R. KH., Institute of Labor Protection VTsSPS Leningrad

RHYTHMS OF MONOTONOUS WORK

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA (Labor Hygiene and Professional Disease) in Russian No 8, Aug 76 signed to press 21 Jul 75 pp 6-9

[Text-English language abstract supplied by authors] Wave-like fluctuation of the time attending execution of monotonous operations reveals the presence of certain cadence in the performance of work. The cadence is unstable and varies within a definite range in its frequency and amplitude, so that the periodicity is fixed statistically against the background of chance fluctuations. The lengths of the oscillation periods turn out to approximate each other with different types of work, as concerns the number of operations making up a period, and this irrespective of the duration of the operations. The rigid pace of the conveyor produces a synchronizing influence on the nature of time fluctuation in performing the operations. Such periodic fluctuations and their changes under the effect of a forced pace of technological processes should be taken account of in planning, organizing and hygienic evaluation of the work to be done. Table 1; figure 1; references 5: 3 Russian, 2 Western.

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